For New Opportunities, More Profit See *Guide To Stories Inside This Issue Pg. 1*

AIR CONDITIONING HEATING & REFRIGERATION NEWS

The Newspaper of the Industry

RESIDENTIAL — COMMERCIAL — INDUSTRIAL February 13, 1961

Vol. 92, No. 7, Serial No. 1,664
Reentered as second class matter October 3, 1936, at the post office at Detroit, Mich., under the Act of March 3, 1879.
Subscription Price, $6 Per Year (U. S. and Canada). Foreign: $10.00 Per Year.
Trade Mark Registered U.S. Patent Office. Copyright 1961, by Business News Publishing Co.

Slower but Steady Growth Now Seen Pattern For Air Conditioning Sales In Early '60s

Heating Systems Highlight of Builder Show

By C. Dale Mericle

CHICAGO—Addition of electric furnaces to the lines of several companies was probably the most significant trend to be observed in the exhibits of air conditioning and heating manufacturers at the 17th annual exposition of the National Association of Home Builders.

Some new heat pumps also made their bow at the show, further pointing up the increasing interest and availability of equipment for year-round all-electric air conditioning.

What was perhaps the most radical change in product design on display was the new Westinghouse "WhispAir" heat pump intended to hang on the outside wall of low cost homes. (Story in Feb. 6 issue.)

Another interesting new design was that of the Rheem "Piggyback" 2-ton air conditioner which the company

(Continued on Page 60, Col. 1)

Critical Water Shortage Seen In U. S. Report

WASHINGTON, D. C. — The United States will probably face a nationwide critical water shortage by 1970; already hundreds of communities have, at one time or another, reported critical water shortages to the U. S. Geological Survey. "By 1970 or before, the nature of our water needs will be severe enough to make the conversion of salt water a major commercial venture, perhaps in the image of mining or oil industries," states a report just issued by the Committee on Science and Astronautics of the U. S. House of Representatives.

While air conditioning is not specifically mentioned in the report, the committee recognized "the flood of new products on

(Continued on Page 55, Col. 1)

Furnace 'Racketeer' Story Gets Reaction

CLEVELAND — Consumer understanding of the need for quality in heating systems is vital in stopping the spread of furnace racketeering by a tiny minority of crooked dealers victimizing homeowners throughout the nation, according to James M. Martin, executive secretary of the National Warm Air Heating & Air Con-

(Continued on Back Page, Col. 1)

✓ INSIDE THIS ISSUE . . . .

LIST OF EXHIBITORS AND CONVENTION FLOOR PLAN.. 80
AIR CONDITIONED SCHOOLS—Universities, school boards announce plans for air conditioned buildings for wider use and greater economy 8, 17
ALL GAS HEATING-COOLING system serves as lab for controls manufacturer 22
UNPROFITABLE SERVICE DEPARTMENT indicates mismanagement — Tips on how to organize, operate department at a profit 24
HERMETIC TRENDS & SERVICE REQUIREMENTS (1).... 32
ARE ENGINEERS JOINING UNIONS? — Reader response to editorial 38
WHITE ROOMS — an expanding, challenging market for air conditioning 44
YEAR-ROUND RESIDENTIAL SYSTEM installed for $1,000 (picture story) 49
CONTRACT MAINTENANCE SERVICE BUSINESS — Strong organization vital to profitable operation. Complex pricing problem discussed 54
CONTRACTOR CAN SELL QUALITY—This one loses interest in prospect who is indifferent to quality story but reveals profit to those who 'buy' quality story..... 56
THERMOELECTRIC REFRIGERATION — New cooling unit and article by engineers indicate progress in field..... 71
HEAT PUMP FOR EXISTING BUILDING—Air-to-water system of 750 hp capacity to cool, heat Detroit Edison service center.. 72
TECH CENTER — Research + RSES + Manufacturer = New Product 76
PACKAGED MULTI-ZONE AIR CONDITIONERS—How one manufacturer designs new line (3) 78
LABOR COST FOR 1960—Chart tabulates average costs for service, installation operations in Los Angeles area..... 85

3 Copeland Officers Elected Directors

SIDNEY, Ohio — Three new directors: Rudolf G. Berg, Benjamin W. Moreland, and Frank J. Gleason Jr., all officers of the corporation, were elected to the board of directors of Copeland

(Continued on Page 4, Col. 5)

Houston Okays Domed, Conditioned Stadium

HOUSTON, Texas—Now that Harris County voters have approved a $22 million bond issue to build an air conditioned enclosed sports stadium large enough to house a baseball field

(Continued on Page 83, Col. 1)

Inside Dope

By GEORGE F. TAUBENECK

Learn to live and laugh — thus delay your epitaph

Take a Chance on Romance?

Is St. Valentine's Day for the birds?

Until a couple of hundred years ago, most European folk would have said yes. They clung to an ancient belief that birds choose their mates for the year on Feb. 14.

Shaky as this theory may have been, St. Valentine's Day always has tempted lovebirds to go out on a limb.

Cards, gifts, and rhymed sweet talk have been the least of it—in 18th Century England a girl's father considered a Valentine equivalent to a proposal of marriage!

The "love lottery," popular in ancient Rome, still is played as a party game by some British boys and girls.

Other romantic gamblers in England and America preferred to pick as their Valentines the first girls they encountered on Feb. 14—sealing the bargain by kissing the "first met." (*How about* reviving that idea)?

St. Valentine Himself

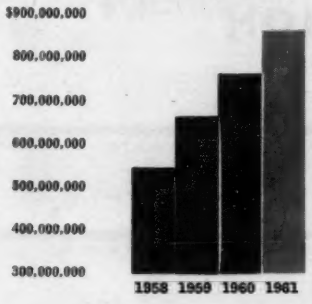
St. Valentine was a young Roman who was martyred for refusing to give up Christianity. He was fed to the lions in 270 A.D. on February 14—the very day that, by coincidence, traditionally had been devoted to

(Continued on Page 42, Col. 1)

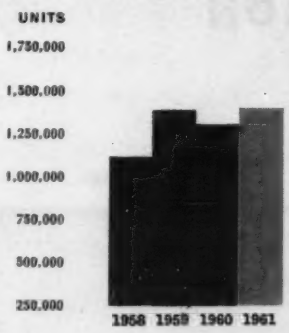
Market Factors Point to Continuing Climb Even If Economy Slows Down

* * *

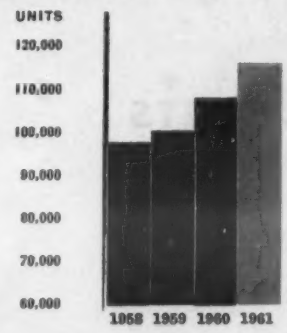
Large A.C. Systems
(Installed Cost)



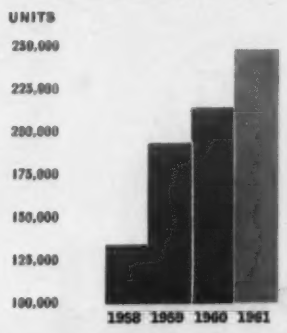
Warm Air Furnaces



Commercial Package A.C.



Residential A.C.



GRAPHS on room air conditioner and auto air conditioner sales are on page 4.

CHICAGO—While it failed to attain hoped-for sales gains in 1960, the air conditioning industry finds some consolation in that its sales performance was relatively better than most other segments of U. S. business. For 1961, hopes for improved sales continue high, primarily because of a growing acceptance of year-round air conditioning as a "necessity" in those applications in which it adds profitability, operating efficiency, or marketability.

This would seem to be the mood of those concerned with the industry's products as they assemble here to view the industry's products at the Fifteenth International Heating & Air Conditioning Exposition which runs from Feb. 13 through Feb. 16 at the International Amphitheatre here.

As the accompanying sales graphs show, the one product recording any great decline was room air conditioners. Other

(Continued on Page 4, Col. 1)

'60 Home Cooling Drop In Wichita Due to Layoffs

By George M. Hanning

WICHITA, Kan. — Although 40% of the contractors contacted by the NEWS during its annual residential air conditioning survey here reported higher sales during 1960 than in 1959, an aura of gloom, brought on by widespread consciousness of adverse local business conditions, hung over the market.

The picture of the local home air conditioning market painted by the NEWS survey and that painted by most local contractors differed about as much as an Eisenhower and a Kennedy appraisal of the national scene.

There is no denying that, after an excellent 1959, residential air conditioning sales in Wichita suffered a substantial setback during 1960.

The setback, estimated at about a 20% drop in sales, was generally attributed by contractors to two economic factors that hit Witchita heavily. One was a substantial layoff by Boeing Aircraft, the city's larg-

(Continued on Page 36, Col. 1)

YOUR COMPLETE SOURCE FOR '61

From freezing foods to cooling homes...

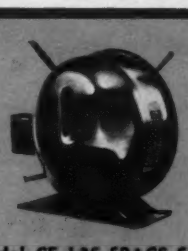
Copeland COMPRESSORS

COPELAWELD
COPELAMETIC
BELT-DRIVEN

WELDED HERMETICS

Model 4U

Model 2U



Model CF 185 SPACE SAVER

DESCRIPTION	**COPELAWELD®** WELDED HERMETIC MOTOR-COMPRESSORS 4 CYLS. 1750 R.P.M.	**COPELAWELD** WELDED HERMETIC MOTOR-COMPRESSORS 2 CYLS. 1750 R.P.M.	**COPELAWELD** WELDED HERMETIC MOTOR-COMPRESSORS • WING BASE MODELS • FLAT BASE MODELS
HORSEPOWER RANGE	**2½ H.P. THROUGH 5 H.P.** SINGLE AND THREE PHASE	**½ H.P. THROUGH 2 H.P.** SINGLE PHASE MODELS	**1/12 H.P. THROUGH ⅓ H.P.** 115/1/60
APPLICATION	UNITARY AIR CONDITIONERS AND HEAT PUMPS	ROOM AIR CONDITIONERS • UNITARY AIR CONDITIONERS	REFRIGERATORS FREEZERS WATER COOLERS VENDING MACHINES BEVERAGE COOLERS AND MANY OTHER APPLICATIONS

Copeland CONDENSING UNITS

FOR ALL HIGH, MEDIUM AND LOW TEMPERATURE APPLICATIONS

SPACE SAVERS

Model EKD-331

COPELAWELD
HIGH, MEDIUM AND LOW TEMPERATURE UNITS
⅛ H.P. THROUGH ⅓ H.P.

REMOTE AIR-COOLED

These NEW MODELS will be introduced at the 15th INTERNATIONAL HEATING and AIR CONDITIONING EXPOSITION CHICAGO • FEB. 13-16

½ H.P. THROUGH 7½ H.P.

REMOTE WATER-COOLED

Model W-100M

COPELAMETIC
½ H.P. THROUGH 10 H.P.

REMOTE CONDENSER UNITS

Model N-300L

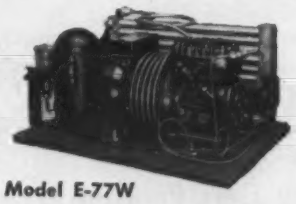
COPELAMETIC
½ H.P. THROUGH 10 H.P.

SELF-CONTAINED AIR-COOLED

Model E-75

COPELAMETIC
¼ H.P. THROUGH 1 H.P.

SELF-CONTAINED WATER-COOLED



Model E-77W

COPELAMETIC
⅓ H.P. THROUGH ¾ H.P.

HERE'S MORE OF WHAT IT TAKES!

MOST COMPLETE PRODUCT LINE

Copeland refrigeration and air conditioning equipment, ranging in size from 1/12 H.P. through 30 H.P., include hundreds of variations to meet specific and rigid specifications. Your best move is to Copeland.

INTERNATIONAL DISTRIBUTION

Wherever you are located . . . in the United States and throughout the free world . . . you can count on Copeland and its 150 full-line wholesalers to meet your requirements quickly. A phone call starts your order rolling.

Copeland® has what it takes!

ACCESSIBLE HERMETICS

AIR-COOLED

Model LAL-300

COPELAMETIC®
ACCESSIBLE HERMETIC
MOTOR-COMPRESSORS

¼ H.P. THROUGH 3 H.P.
SINGLE AND THREE PHASE

COMMERCIAL REFRIGERATOR DISPLAY CASES
REACH-IN REFRIGERATORS
LOW-TEMPERATURE DISPLAY CASES
DAIRY PRODUCTS DISPLAY CASES
BULK MILK REFRIGERATION SYSTEMS
TRANSPORT REFRIGERATION
FROZEN FOODS PROCESSING
ICE-MAKING EQUIPMENT

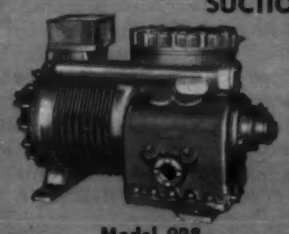
WATER-COOLED

Model MAF-500

COPELAMETIC
ACCESSIBLE HERMETIC
MOTOR-COMPRESSORS

¼ H.P. THROUGH 7½ H.P.
SINGLE AND THREE PHASE

SUCTION-COOLED



Model 9R8

Model 6R48

COPELAMETIC
ACCESSIBLE HERMETIC
MOTOR-COMPRESSORS

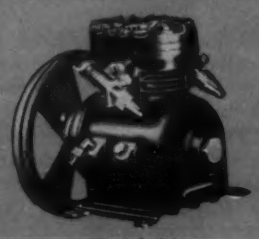
2 H.P. THROUGH 10 H.P.
SINGLE AND THREE PHASE

COPELAMETIC
ACCESSIBLE HERMETIC
MOTOR-COMPRESSORS

7½ H.P. THROUGH 30 H.P.

COMMERCIAL REFRIGERATION UNITS, HIGH, MEDIUM AND LOW TEMPERATURE APPLICATIONS
UNITARY AIR CONDITIONERS AND HEAT PUMPS
ENVIRONMENTAL TEST EQUIPMENT
CENTRAL STATION WATER CHILLERS
GUIDED MISSILE TRACKING AND TELEMETERING EQUIPMENT COOLING

BELT-DRIVEN



Model 18

COPELAND
COMPRESSORS
- AIR-COOLED
- WATER-COOLED

1/6 H.P. THROUGH 7½ H.P.

FOR REFRIGERATION
AND
AIR CONDITIONING
APPLICATIONS
WHERE VARYING
CURRENT CHARACTERISTICS
REQUIRE FLEXIBILITY

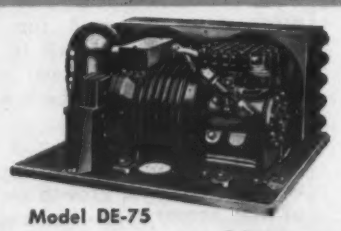
COMBINATION AIR AND WATER-COOLED

Model Z-200WA

For use where an air-cooled unit is desired, but high ambient temperature is encountered occasionally — or where water is limited or high priced.

COPELAMETIC
½ H.P. THROUGH 3 H.P.

SELF-CONTAINED, EXTRA-LOW HEIGHT

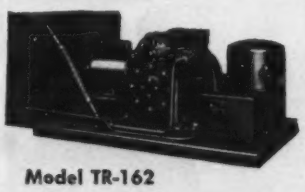


Model DE-75

These units are designed for special applications where height must be an absolute dimensional minimum.

COPELAMETIC
½ H.P. THROUGH 2 H.P.

TRUCK UNITS



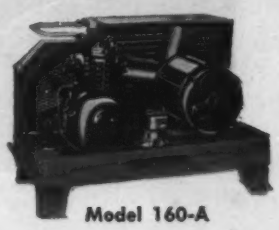
Model TR-162

Usually a permanent part of a holdover truck refrigeration system, units are plugged in at the garage and refrigeration stored for the run.

COPELAMETIC
½ H.P. THROUGH 3 H.P.
(3 H.P. M. & L. TEMP.)

Write for technical bulletins on Copeland products that fit your needs.

BELT-DRIVEN



Model 160-A

REMOTE, AIR-COOLED
¼ H.P. THROUGH 3 H.P.

SELF-CONTAINED
AIR-COOLED
1/6 H.P. THROUGH ½ H.P.

REMOTE, WATER-COOLED
⅓ H.P. THROUGH 7½ H.P.

COMBINATION
AIR-WATER COOLED
½ H.P. THROUGH 3 H.P.

TRUCK MODELS
½ H.P. THROUGH 3 H.P.

SALES FOLLOW-THROUGH

From an application for guided missiles to a single-room air conditioner, Copeland and Copeland wholesalers offer the technical assistance that keeps customers satisfied. Let us review your application requirements. Write, wire or phone.

SINCE 1918 **Copeland** REFRIGERATION CORPORATION, Sidney, Ohio

1961 Predictions--

(Continued from Page 1, Col. 5)

product categories showed either slight increases or decreases. Predictions for 1961, as often happens following a year that failed to come up to expectations, are on the cautious side: whereas forecasts for 1960 called for increases of 20 to 40%, this year 10 to 20% is the rule.

There are market factors other than the continued growing acceptance of year-round air conditioning that make it probable that many types of products will register sales gains in 1961.

Predictions by those close to the construction field look to an increase of 4-8% in non-residential building for the year. The "1961 Institutions Outlook" just released by the Marketing and Research Bureau of *Institutions Magazine* predicts that institutions construction, which has moved ahead steadily for over five years, will reach a new peak of $14.4 billion in 1961, up $340 million over 1960's $13.96 billion. Hospital and sanitoria top all other segments in this market category (excepting the military) with a prediction total of $1.065 billion, compared with $1.015 billion in 1960. Colleges and schools, excluding dormitories, are the next highest category, with a $4.4 billion estimate for 1961, and school air conditioning is taking hold fast (see report elsewhere in this issue).

In analyzing the growth of big systems, one major producer of large liquid chillers sees a growth at the rate of about 15% a year holding steady for several years, this being based on both past performance and future prospects.

While the "big breakthrough" is yet to come in industrial plant conditioning, an increasing amount of new plant construction is being at least partially equipped. Also, the "clean room" or "white room" concept in assembly operations requiring dust-free surfaces or maintenance of close tolerances has created a need for complete plant air conditioning. (A comprehensive story on white rooms and the market they create for the industry's products will be found in this issue).

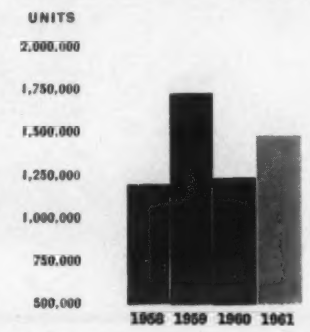
Sales of commercial package air conditioning, on something of a plateau for a number of years, have been given a boost by equipment design improvements, such as the rooftop unit and the greater applicability of heat pumps. A continuing extending of the upper limits of capacity of package units has helped in this field, with many system designers taking another look at "multiple unit" installations of package air conditioners as a solution to problems of cost as well as design in big air conditioning installations.

Sales of residential air conditioners still have not "taken off" to register the kind of year-to-year increases expected. However, in view of the fact that next to room air conditioners, central residential systems are probably most sensitive to adverse weather conditions, the 1960 performance was not too bad. There were indications that many builders are seeing the light, and have found year-round systems a valuable sales point.

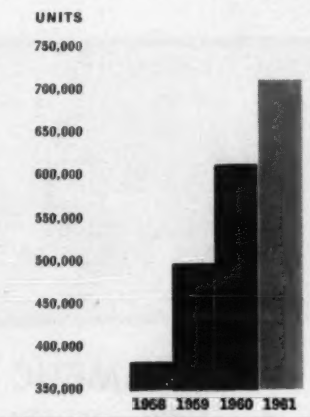
Any considerable increase or decline in new home starts will have some effect on residential system sales, but minor changes will not have much impact. (There are some signs indicating that new home starts may increase in 1961: in December the seasonally-adjusted rate of FHA new-home applications showed an upturn for the first time since August and help for the housing industry is high on the new administration's agenda for action).

Improved products, greater realization by the builder and home buyer that a home not air conditioned is becoming obsolescent before it is occupied, together with any improvement in the weather, could mean a total in residential units well past the 250,000 mark. The first two points are generally accepted facts, the third is a matter of pure chance.

Room Air Conditioners



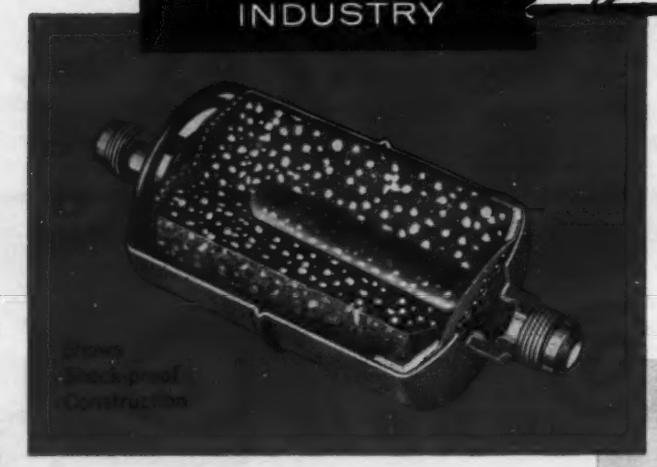
Auto Air Conditioners



ALCO offers the FIRST and ONLY Silica-Gel P.A. 400 and Molecular Sieve BLOCK DESICCANT FILTER-DRIER to the REFRIGERATION INDUSTRY

Mr. A. D. K. says: To Protect the System and Yourself use the

ALCO DK DRI-KLEANER



Important Advantages and System Benefits:

1. Exclusive Alco binder assures a block of 97% pure desiccant.
2. Manufactured by Alco's specially developed forming process (not pressure moulded)—eliminating packing effect—assuring greater uniformity of flow.
3. Geometry of ADK block exposes maximum surface to adsorb and filter out moisture and fine particles.
4. Directed and even distribution of liquid gives filtration in depth—coupled with short flow path means low pressure drop—longer system life.
5. Rigidly controlled activation—factory sealed.
6. Maximum system protection against acids and other foreign matter.
7. Copper (ODS) fittings mean easy brazing.
8. Brass (SAE) fittings means no flare nut creep.
9. Full flow fittings mean low pressure drop.

ALCO DRI-KLEANER is your insurance for a longer, more trouble-free system life.

ALCO

• BUY SECURITY
• BUY QUALITY
• BUY ALCO

ALCO VALVE CO.
8328 853 KINGSLAND AVE. • ST. LOUIS 30, MO.

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors • Solenoid Valves Refrigerant Filter-Driers • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

Copeland Directors-

(Continued from Page 1, Col. 2)

Refrigeration Corp. at a recent meeting of shareholders. By board action Frank J. Gleason, Jr. was named treasurer. Position of controller, which he formerly held, will be filled by John Richard who had been assistant controller.

Frank J. Gleason, president of the company, reported that sales for the first quarter of the fiscal year declined to $7,736,932 from $10,031,323 in the corresponding quarter of the previous fiscal year, this being in line with an earlier prediction that the first fiscal quarter would be affected by inventory reduction by customers.

However, he said that orders have been picking up since the first of the year at a rate commensurate with that of the same period last year, and that prospects were good for the company to do as well if not better than the last fiscal year, which set records for both sales and earnings.

In announcing election of the new directors Gleason emphasized the over-all growth record of the corporation—the expansion of operations in the international field and the necessity of preparing for the tremendous potential of the next decade. "Foremost in our thinking," said Gleason, "is the need for a greater contribution to the direction of Copeland from executives actively engaged in the day-to-day operations combining both a favorable balance of age and seasoned industry experience."

Power Conference Plans Session on Air Conditioning

CHICAGO — A session on space air conditioning, sponsored by the American Society of Heating, Refrigerating & Air-Conditioning Engineers, is among features programmed for the 1961 American Power Conference to be held March 21-23 at the Sherman hotel here.

This 23rd annual conference is sponsored by Illinois Institute of Technology in cooperation with nine national technical societies and 14 universities.

The space air conditioning session is scheduled for Tuesday, March 21, from 2 to 5 p.m. Chairman is Gilbert F. Carlson, chief engineer, Specialties Div., Bell & Gossett Co.; co-chairman, William V. Richards, president, Illinois Chapter, ASHRAE, H. A. Phillips & Co.

Subjects and speakers are listed as follows:

"Off Peak Electricity Using Stored Water for Space Heating," Stanley B. Tupper, Engineering Dept., Bell & Gossett, and Raymond J. Vertovec, engineer, Electric Heat Technical Section, Commonwealth Edison Co., Chicago.

"A New Approach to Heat Pumps," Gilbert M. Warren, sales engineer, Carrier Air Conditioning Co.

"Thermoelectric Heating and Cooling Devices," J. D. Richards, Thermoelectric Products, Minnesota Mining & Mfg. Co.

"High - Temperature High - Pressure Hot Water Heating," D. Lorne Lindsay, professional engineer, Wiggs, Walford, Frost & Lindsay, consulting engineers, Montreal, Can.

Universal Cooler Co. Handles B-W Units In Most of Canada

EVANSVILLE, Ind. — The Universal Cooler Co. of Barrie, Ont., Can., has been appointed sales representative for Bendix-Westinghouse condensing units and motor compressors in Canada, east of British Columbia.

In announcing this revision in marketing plans in Canada, Donald J. Wood, general sales manager of Bendix - Westinghouse, stated that Universal would import units into Canada for stocking in its warehouse in Barrie.

Canadian manufacturers and wholesalers will be able to purchase compressors and condensing units from the warehouse f.o.b. Barrie.

Universal will carry a complete stock of compressors from ¼ to 4 hp and condensing units from ¼ to 3 hp. These units will include both R-12 and R-22 for refrigeration and air conditioning. Replacement parts will also be available.

Plan on Conditioning 3 Denver U. Structures

DENVER — Air conditioning will be a feature of the first three buildings of the Boettcher Center for Science, Engineering, and Research at the University of Denver.

West Massachusetts Says Electric Heat Homes Double Goals

PITTSFIELD, Mass. — Western Massachusetts Electric Co. has 500 electrically - heated homes on its lines, exceeding by almost 100% the three-year goal set by the firm when it launched a house-heating drive in 1957, according to J. F. Burt of Pittsfield, who is director of residential and commercial sales.

Burt added that the 500 houses were not in the exclusively expensive field but include all price brackets.

Seventy of the houses are in the 22 communities served by WMEC's Pittsfield district. Burt said 10 more electrically-heated houses were under construction in this area.

To Provide a 'Tip' Service

Contractor Group To Stage Clinic For Coast Multiple Dwelling Show

LOS ANGELES — To create greater public awareness of the advantages and comforts of air conditioning in multiple dwellings, the Certified Refrigeration & Air Conditioning Foundation has been called upon to present a special clinic at the Los Angeles Multiple Dwelling Show March 8 through 12.

Under the show's theme of "Techniques in Tenant Appeal," the CRAC presentation will stress the importance of proper engineering, installation, and maintenance savings of air conditioning systems to provide the maximum in benefits for building owners and occupants.

A special feature of the refrigeration and air conditioning clinic will center around two, 20-minute daily discussions giving valuable tips to owners and architects as to the best means of obtaining properly engineered and the proper installation of air conditioning systems. The talks will be made by experienced representatives from the Southern California air conditioning industry.

As part of the foundation's participation in the show, the organization will display enlarged reproductions of its advertising and promotional campaigns which emphasize how air conditioning and refrigeration assist owners of better class apartment buildings in attracting and keeping tenants on a permanent basis.

L. P. Jacobsen is chairman of the Certified Refrigeration & Air Conditioning Foundation. The foundation is comprised jointly of air conditioning and refrigeration contractors in Los Angeles and Orange Counties and representatives of the Refrigeration Fitters, branch local 250, UA. Purpose of the foundation is to encourage standards of service performance and reliability which will benefit the industry and its customers.

Larkin Names Outlet

ATLANTA — Authorized Refrigeration Parts Co. of St. Louis has been appointed Larkin refrigeration jobber in the St. Louis area, according to J. E. Palmer, sales manager of Larkin Coils, Inc. here.

Since 1934.... *bringing to you*

the world-renowned quality of the leading producers

of Refrigeration and Air Conditioning Equipment

For more than a quarter century, serving as INTERNATIONAL DIVISION for the greatest names among manufacturers of Refrigeration and Air Conditioning equipment, SILLCOX REFRIGERATION CORPORATION has been equipped to meet every need of users and distributors everywhere. Complete systems, units, or components—whatever you require, are available to you from this single source and with the following advantages:

★ Manufacturer's lowest prices
★ Equipment of highest quality supported by full manufacturer's warranty
★ Simplified ordering, maximum savings through one reliable source of enviable reputation
★ Time proved awareness of your requirements from viewpoints of service and product performance

BASIC EQUIPMENT, COMPONENTS and ACCESSORIES

available to you from Sillcox Refrigeration Corporation

ACME INDUSTRIES, INC.
Oil Separators, Liquid Chillers, Cooling Towers, Evaporative Condensers, Ammonia & Freon Condensers, Heat Pumps, Remote Room Conditioners, Multi-zone Conditioners

ALCO VALVE CO.
Control Valves

CARNES CORPORATION
Air Distribution Outlets

COPELAND REFRIGERATION CORP.
Condensing Units, Compressors (¼ to 30 hp)

KEROTEST MANUFACTURING CO.
Line Valves & Fittings

KRAMER TRENTON COMPANY
Unit Coolers & Condensers, Self-contained Thermo-Banks

Mc CRAY REFRIGERATOR CO., INC.
Commercial Refrigerators, Display Cases and Freezers

PACKLESS METAL HOSE, INC.
Vibration Absorbers

PENN BRASS & COPPER CO.
Copper Tubing

TRANTER MANUFACTURING INC.
Plate Evaporators, Truck Refrigeration

SELF-CONTAINED and PACKAGED

Sold by Sillcox International Corporation

Air Conditioners—Oil, Gas & Electric
Beverage Coolers
Central Air Conditioning Systems
Commercial Quick Freezers
Dehumidifiers
Dishwashers
Heaters—Gas & Oil
Home Quick Freezers
Household Refrigerators—Electric, Gas, Kerosene
Humidifiers
Ice Cream Cabinets
Ice Makers
Milk Coolers
Walk-in Refrigeration Rooms
Water Coolers & Fountains

Your cabled or airmailed inquiry will receive prompt attention!

SILLCOX REFRIGERATON CORPORATION

70 PINE STREET • NEW YORK 5, N. Y. • U.S.A.

Cable Address: "COXSIL NEW YORK"

Dirtproof and Burglarproof

TWO UNWANTED INTRUDERS—dirt and burglars—are prevented from getting into the vaults of Minneapolis' new First National Bank through the air conditioning system. The first intruder—dirt—is electrically "scrubbed" from all incoming air by a battery of Honeywell electronic air cleaners. And burglars are foiled by this hinged air duct. During banking hours the duct swings down and clamps over the hole, feeding clean air into the vault. At night the duct is swung up out of the way and a heavy safe door locked in place, preventing burglars sliding down the duct and into the vault

Patient Recovery Rate Also Rises

Data from Many Sources Proves Air Conditioning's Ability To Increase Efficiency, Productivity, and Learning Rate

COLUMBUS, Ohio — "There is now considerable data to prove the percentage increase in office and factory workers' efficiency and productivity, the speed of recovery of hospital patients, and the improvement in the learning rates of students through the use of air conditioning," stated W. J. Ortman, market sales manager, industrial buildings, for Minneapolis-Honeywell Regulator Co.

Speaking before the American Gas Association's recent Gas Air Conditioning Sales School, Ortman authenticated his general statement with these examples.

A search of all published literature related to increased efficiency through air conditioning showed that reports in office buildings resulted in increases in efficiency from 20% to over 50%, and in factories from 22% to 28%.

FACTORY ABSENTEEISM DOWN 27 TO 30%

In office buildings, reports relating to reduced absenteeism showed reduction from 27% to 30%, and in 75 factories similar reductions.

A report of labor turnover indicated a reduction of 40%.

A survey of churches indicated improved attendance of as much as 50%.

The Detroit Edison Co. made an efficiency study in their drafting room a few years ago. Without air conditioning, 9,000 work units required 5,000 man-hours. Following the installation of air conditioning, 10,500 work units required only 3,900 man-hours, indicating an increase in efficiency of 51%.

STENOGRAPHERS 24% MORE EFFICIENT

The Federal government conducted a stenographic test when stenographers typing triangulation data worked two weeks in a non-air conditioned space and were then transferred to an air conditioned space. Using the same typewriters, their output increased 24%.

C. F. Braun & Co., oil refinery and chemical manufacturers, moved into a new building with air conditioning, and they reported a 35% increase in the efficiency of 575 white collar workers. However, some of this increase may have been due to better lighting and improved space arrangement.

MAINTENANCE COSTS CUT 80%

John Hardy & Son, manufacturer of nylon hosiery at Pulaski, Tenn., reported a 29% increase in production after installing air conditioning. The knitting machines required less maintenance and maintenance costs dropped 80%.

EMPLOYER LOSES $108 PER EMPLOYE WITHOUT COOLING

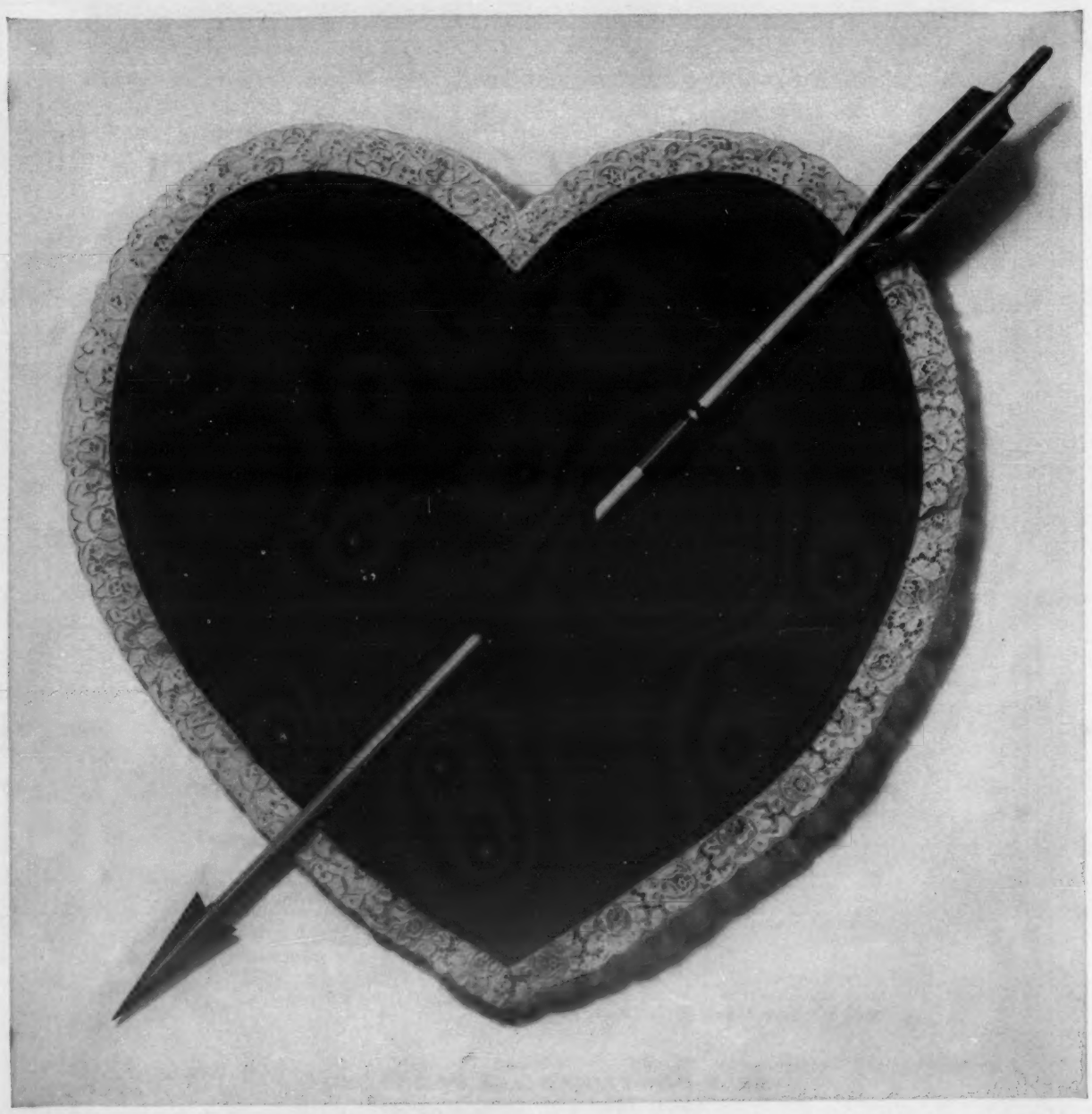
A survey of 75 manufacturing plants in the New York City area indicated that 100 days in each year are so hot or humid that employes either slow down or stop work entirely during part or all of the day, and that the employers lose an average of $108 each year for each employe working in a non-air conditioned building. Plant absenteeism dropped 25% to 30% after the installation of air conditioning, turnover in personnel was reduced, cleaning costs were lower, and productivity increased.

REWORK DROPPED 25% WITH AIR CONDITIONING

The Elgin National Watch Co. reported that their rework decreased 25% after they added air conditioning, and that employe efficiency increased.

Expanding on the market opportunities suggested by such findings, Ortman stressed that "Too often, in the design of a modern building, major attention is given to visual environment and too little attention is given to the other elements of the total indoor environment with the result that the mechanical and electrical facilities often cost more and are sometimes less efficient.

"It is in this area that we have the greatest opportunities to reduce the cost of today's buildings. . . . . Then we can move in with a legitimate presentation on thermal environment—year-round air conditioning," he concluded.



WILL YOUR CUSTOMERS STILL LOVE YOU IN 1966?

Five years from now, will your air conditioning customers still be as satisfied with the equipment you're selling today? Or will they be disillusioned by poor performance and the high cost of operation and maintenance?

There's one sure way to keep your customers' affection—and keep your own cost of servicing low—and that's to install quality equipment . . . Chrysler equipment.

You can't put a price tag now on the extra value Chrysler's 25 years of air conditioning experience adds to every unit. But you *can* see the quality engineering features *standard* on Chrysler equipment for which your customers normally pay extra. And in 1966, you'll be able to compute the money you've saved on service calls . . . and count the Chrysler compressors that didn't fail.

One more question to ask yourself: Will the manufacturer of your present line even be in business five years from now to supply parts and servicing? You know Chrysler will!

You owe it to your future profits, and your customers' confidence, to get the full story on Chrysler air conditioning and furnaces. Call your local Chrysler Distributor . . . today!

CHRYSLER AIRTEMP

Chrysler Corporation, Airtemp Division, Dept. C-21, Dayton 4, Ohio

Shhhhhhhhhhhhh! Men hard at work

Experienced Lau Engineers are constantly working to develop improved air handling equipment for their customers' immediate and future requirements. This effort is backed by the most modern test facilities in the blower industry. Through a concentrated program such as this, Lau's customers are assured of receiving the most efficient, dependable blower available to meet their particular application. Write or call Lau today for accurate information regarding your air handling application.

The Lau Blower Company • Dayton, Ohio

Trinity University Builds Central Heating, Cooling Plant on Campus

SAN ANTONIO — A central heating and cooling plant now under construction at Trinity university here will pipe hot and chilled water to several campus buildings for year-round air conditioning.

The plant will be completed by mid-1961, and will use an absorption machine which uses the heat from high temperature hot water to produce chilled water, the university reported.

University officials decided on a central plant to supply heating and cooling because it "offers economy of operation and lower first costs over a longer amortization period than individual room or building units." It also provides more flexibility in meeting changing loads, they said.

The George Storch Memorial Library and Preston Northrup Hall, a classroom and administration building, will be the first buildings served by the new plant and will use about 50% of the 375-ton capacity of the initial Carrier absorption unit.

Space is provided in the utility center for the addition of another heat-activated unit to serve future buildings. The system can be expanded to eventually total more than 1,000 tons cooling capacity.

A single fuel—natural gas, provided by the City Public Service Board of San Antonio, will energize the system. It will be used by the boiler to supply high temperature hot water used by the absorption machine for cooling and to a hot water generator to supply hot water for heating.

Selection of equipment and system was by R. S. Purvis, director of physical plant at Trinity; design, plans, and specifications by Martin Staley, consulting engineer; and utility plant building design by O'Neil Ford Associates, architect.

Air Conditioned Schools

MOMENTUM being gained by the move toward air conditioned schools is pointed up by the examples on this page and page 17. Space limitations prevent publication of many more such stories.

Air Conditioning Is Cheaper Than New Buildings—Kalamazoo Prexy

KALAMAZOO, Mich. — The 12-month plan recently adopted by his school would "give many small colleges the opportunity to grow, even to prosper, while paying salaries that will attract to their faculties the best of what they produce," according to Weimar K. Hicks, president of Kalamazoo college.

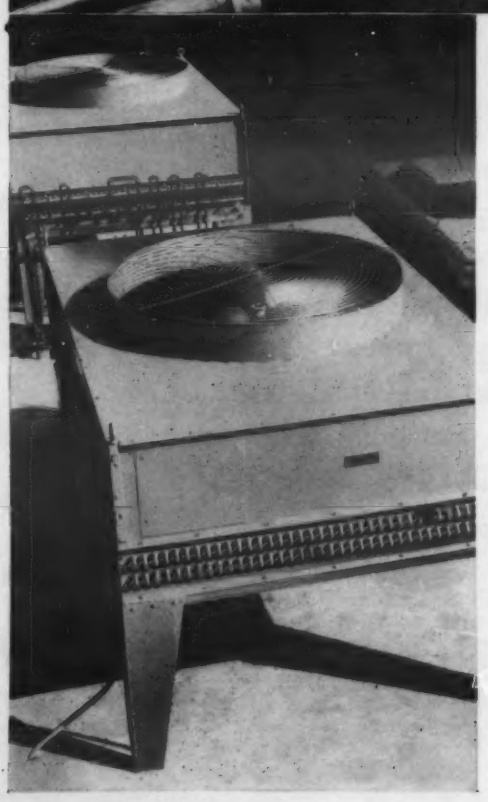
And to those who object to schoolwork in summer heat, Hicks says:

"It is a lot cheaper to install air conditioning equipment than to pay for a new classroom building or dormitory."

Under the Kalamazoo plan, the 128-year-old coeducational private liberal arts school will change over from the traditional nine months of classes to year-round operation. Objective is to boost student capacity of 675 by as much as 66%—without any new buildings.

Beginning this fall, students will enroll for three 11-week quarters each year. The vacation quarter will be staggered, with about 25% of the students on vacation during each quarter. The plan will make it possible to earn a bachelor's degree in three years.

(The NEWS, throughout the past year, has been promoting —in editorials, "Dopes," and feature articles—the trimester concept. As noted by George F. Taubeneck in a recent "Inside Dope" column, the trimester idea—"which, incidentally, is made possible by air conditioning—enables students to graduate in three years instead of four, adds substantially to teacher income, and could save taxpayer dollars by the billion.)



. . . H&M's Limitrol valve lets you use them year-round!"

"Many of my air conditioning and refrigeration systems have to operate 12 months a year. But cold weather used to raise cain with compressor-condenser balance.

"Then I learned that Halstead & Mitchell had a Limitrol pressure modulating valve that adjusts their air-cooled condenser capacity to compressor head pressure, whatever the outside temperature. What's more, H&M gives me multiple circuiting at no extra cost!"

You'd do well, too, to standardize on H&M Air-Cooled Condensers. There are propeller fan models with vertical or horizontal air discharge, and centrifugal fan models for inside installation with ductwork. Capacities of 5 to 100 tons.

Want more information? Call your parts wholesaler or write for Bulletin AC-102. Halstead & Mitchell Co., Bessemer Building, Pittsburgh 22, Pa.

Air-Cooled Condensers • Air Handlers and Coils • Cooling Towers • Water-Cooled Condensers

HM Halstead & Mitchell

Consider Compact, Air Conditioned Elementary Schools

SPARTANBURG, S. C. — School District 6 is considering building a compact, air conditioned elementary school that will cost around $300,000.

The building would contain 12 classrooms and have a capacity of about 350 students. Plans, drawn by Lockwood-Greene, engineer, include a "cafetorium," library, offices, and service facilities.

The school could be "one of the first of the new air conditioned, compact types now being heralded as a partial answer to school construction problems," it was pointed out in a local press report. "City Schools is planning a similar building as an addition to Carver High school.

"Architects, engineers, and school officials maintain the new type can be constructed for about the same amount as conventional window-wall schools. Compactness is gained because the air conditioned classrooms can be arranged more conveniently, thus cutting costs."

Board Votes To Build All Future Schools For Air Conditioning

CHARLOTTE, N. C. — The Mecklenburg County School Board, having already approved air conditioning of one school, recently laid plans for possibly air conditioning others.

The board voted unanimously to have all future school buildings designed to include the possibility of air conditioning.

A spokesman commented: "The board did so in acknowledging strong trends toward an extended school term—perhaps to 10 or 11 months.

The board in December approved plans to air condition Ashley Park High school because the school is near the airport and noise from overhead planes will make closed windows a necessity.

QUICK REFERENCE GUIDE

Diversified line of YORK Air Conditioning and Refrigeration Systems and Equipment... Designed for today's specialized applications in temperature-humidity control and air distribution.

YORK®

CORPORATION
Subsidiary of Borg-Warner Corp.®
YORK, PENNSYLVANIA

YORKAIRE 3-PIPE SYSTEM

Delivers Heating or Cooling Instantly to any Induction or Fan-Coil Unit in a Multi-Room Building

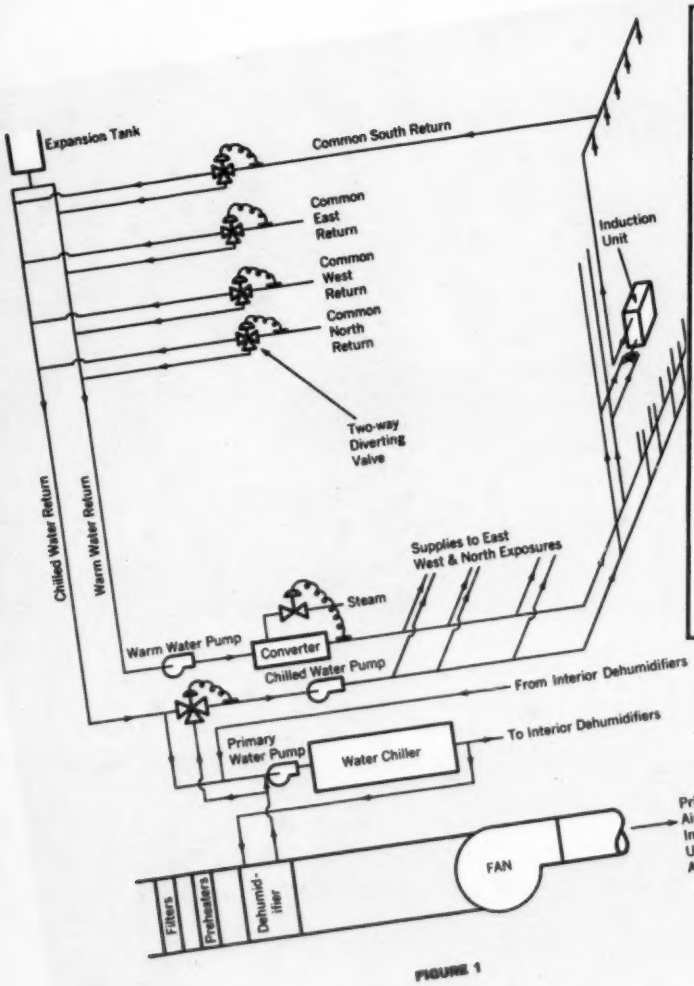
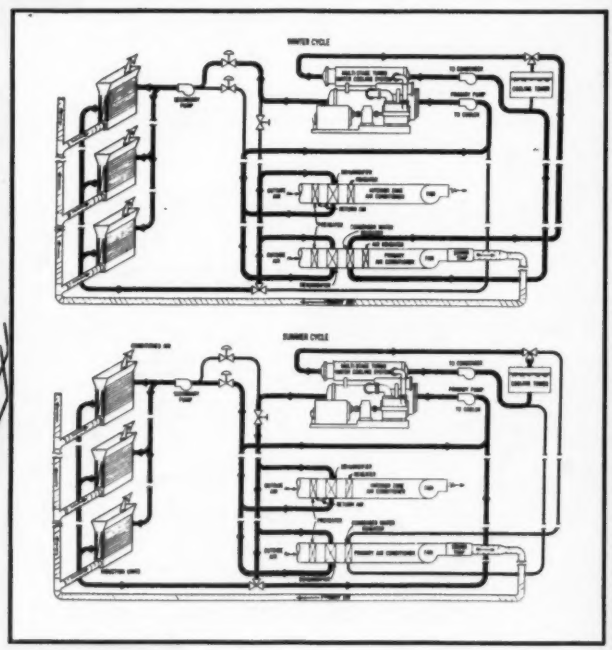
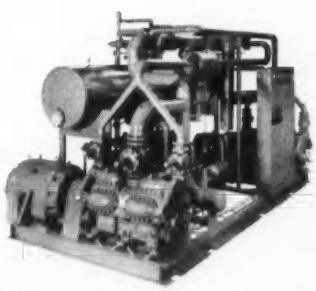


FIGURE 1





At left: Schematic diagram of Yorkaire 3-Pipe System with primary air supply.

Upper right: Schematic diagram of hot and chilled-water systems.

Lower right: View of York Heat Pump for Yorkaire 3-Pipe System.

Yorkaire 3-Pipe Systems provide unparalleled personal comfort. The occupant of each room in the building has a choice of either instant heating or cooling and ventilation when he dials his fan-coil or induction conditioner. The control valve modulates the flow of either hot water for heating or chilled water for cooling.

Costly reheaters and return air ducts are eliminated. Since primary air requirements are reduced, a considerably smaller equipment room is needed . . . freeing valuable space for other uses. Besides providing the ultimate in zoning, the entire system is unequalled for space-saving features.

YORK CONDITIONERS

Supply air for YORKAIRE 3-Pipe Systems, Conventional and Perimeter Installations

YORK HI-I

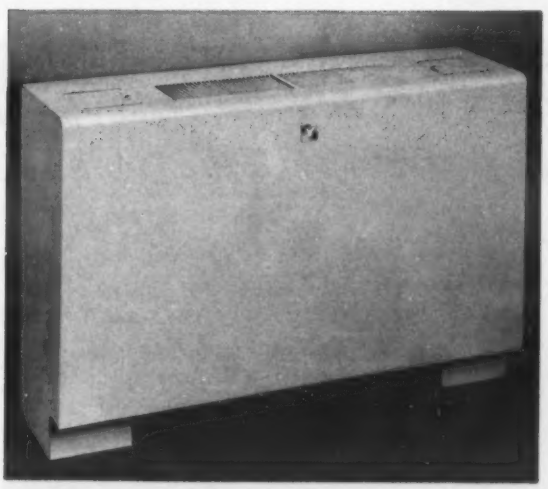
INDUCTION CONDITIONERS

York Hi-I Induction Units more than double the flow of conditioned air and sensible cooling capacity by providing High Induction of room air. This is especially important in the modern building where large glass areas and high intensity lighting create greater cooling requirements than were previously known.

With H-I induction units it becomes possible to safisfy these greater cooling requirements with a primary air system sized to meet only the minimum ventilation requirements. This reduces the equipment-space requirements throughout the building. Also, the Hi-I induction units are easily applied and installed either wall hung or floor supported. Both of these features reduce initial and installation costs below those required by conventional induction units.

YORK UNIVERSAL

FAN-COIL CONDITIONERS



New in 1961—York's UNIVERSAL line of room fan-coil air conditioners provides a wide range of models for all applications. All models are designed for quick, low cost installation. For example, ceiling hangers permit one man installation of horizontal models.

Available in four basic model sizes—200, 300, 400, 600 cfm—all models are listed with Underwriters Laboratories.

- Floor Supported Basic Model
- Wall Supported Basic Model
- Ceiling Basic Model
- Ceiling Plenum Basic Model

Available in five decorative enclosure types finished in owner's choice of four baked enamel finishes to blend with any room decor.

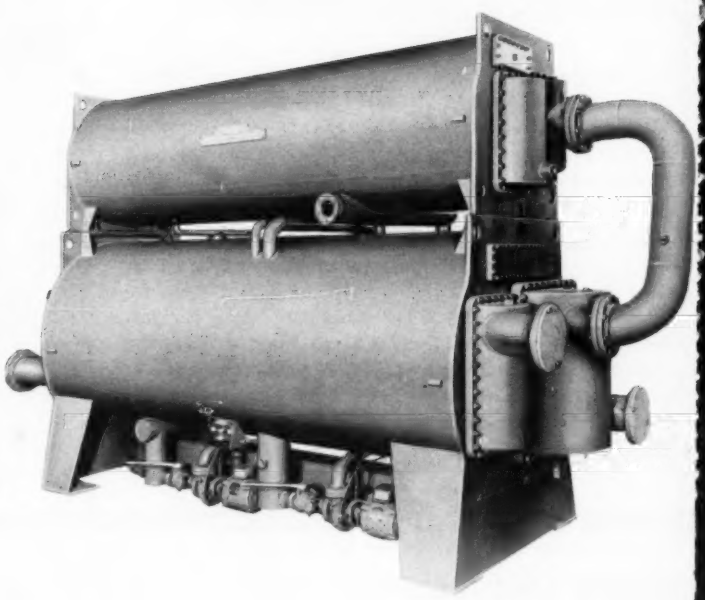
- Floor Enclosure
- Semi-Recessed Enclosure
- Off-The-Floor Enclosure
- 19″ Sill Height Enclosure
- Ceiling Enclosure

Let your York representative demonstrate to you how this wide application selection can save you money, both in system design and installation.

YORK WATER CHILLERS SUPPLY INCLUDING YORKAIRE 3-PIPE SYSTEMS

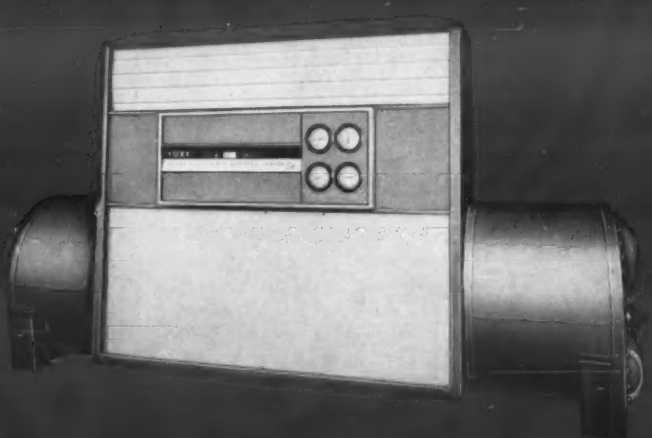
YORK ABSORPTION SYSTEMS

York Absorption Systems provide chilled water for air conditioning and process refrigeration. Operation is economical, using hot water or low-pressure steam. Capacity can be varied economically according to demand, from overload to as little as 10% capacity. Operation is quiet; maintenance is simple—three small pumps with motors are the only moving parts. Capacities 50 to one thousand tons.



YORK TURBOPAK

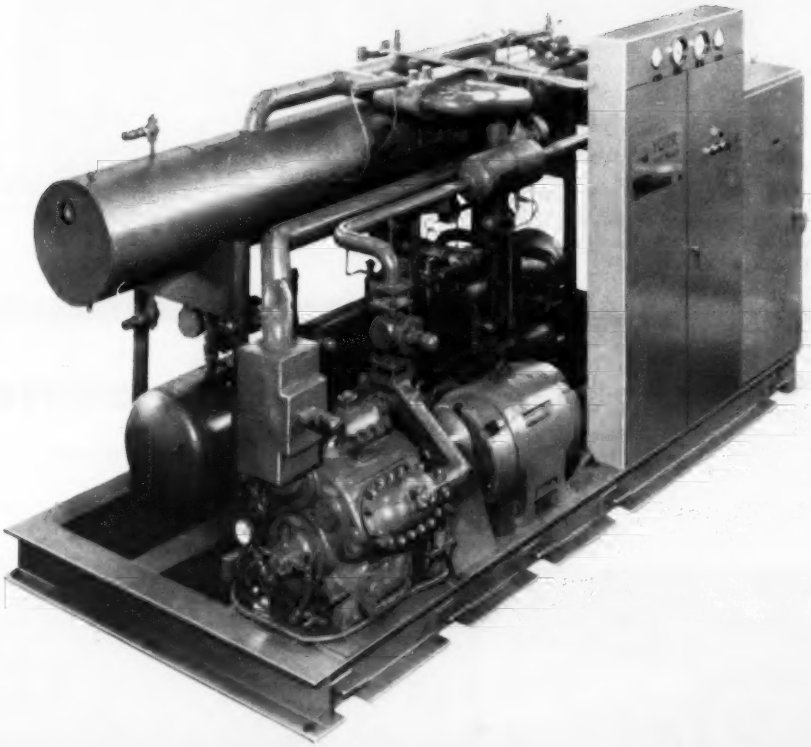
York Hermetic Turbopak Centrifugal Water Chillers provide cold water for air conditioning. Operation is quiet. Factory assembled, pre-wired, and designed to reduce floor space, weight, and installation work. Capacities from 65 to 600 tons.



COOLING FOR ALL AIR CONDITIONING SYSTEMS
AND CONVENTIONAL INSTALLATIONS

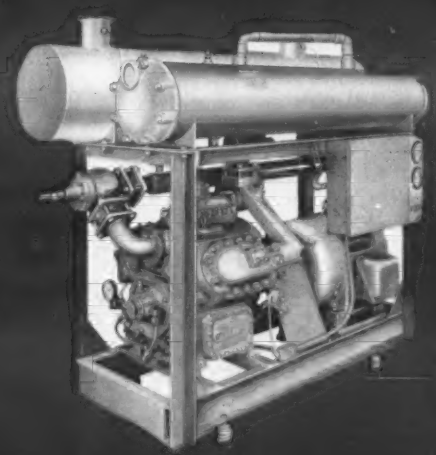
YORK
HEAT PUMPS

York Heat Pumps provide both hot and cold water for air conditioning. They can cool sunny rooms and "pump" the heat to warm the shady rooms, all thermostatically controlled. Using only outside air and incoming power lines, installations are practical in cold as well as warm climates since York's multi-stage compression extracts heat from sub-freezing air. Capacities are from 50 to 150 tons, and 280 to 1,230 MBH in factory packages or custom designed to meet other requirements. Turbomaster Centrifugal Compressors extend the range to 1700 tons and larger.



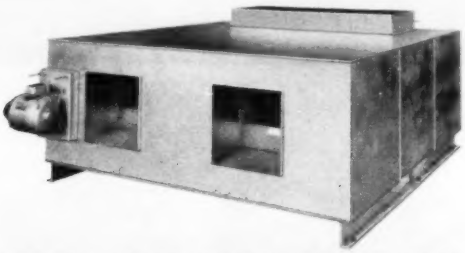
YORK
PACKAGED WATER CHILLER

A complete line of York Packaged Water Chillers to provide cold water for air conditioning and process refrigeration. Operation is based on product load . . . compressor step-unloads with power savings almost directly proportional. Capacities to 200 tons.



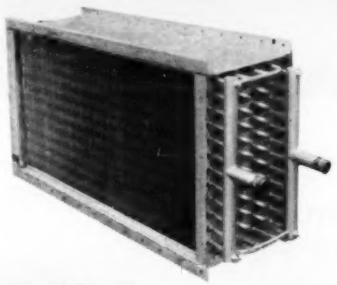
YORK CENTRAL STATION AIR CONDIT

Treat and circulate air for comfort or process work with



YORK CENTRAL STATION AIR CONDITIONERS

York Central Station Conditioners filter, cool, heat, humidify, dehumidify, and circulate air for comfort or process work. Horizontal, vertical, and multi-zone units. Capacities: 800 to 36,000 cfm.



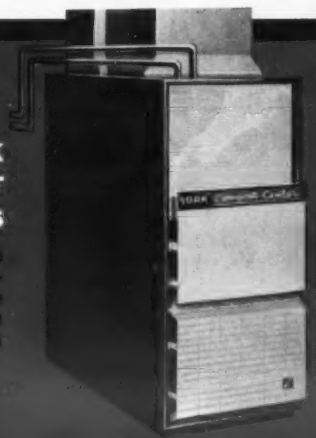
YORK COILS York Hi-Eff Finned Cooling and Heating Coils feature high efficiency heat transfer and quality construction, designed for application ease . . . for chilled or hot water, brine, direct expansion refrigerants, standard and non-freeze steam.

YORK PACKAGED AIR CONDITIONERS utilize

comfort . . . by closely coordinating

YORK COMFORT CENTERS

York Comfort Centers provide residential and gas-fired heating. Electronic filters clean the air. Capacities: 3 to 5½ tons cooling; 80,000 to 160,000 Btuh heating.



YORK CHAMPIONS

York Champion Air Conditioners and Air-Cooled Condensing Units have up to three compressors and three fans in step sequence. Dual coils sub-cool the refrigerant. Makes possible comfort cooling even when it's zero outdoors. Available in models for ceiling suspension. Capacities: 3 to 22½ tons.

YORK EMBASSY UNITS

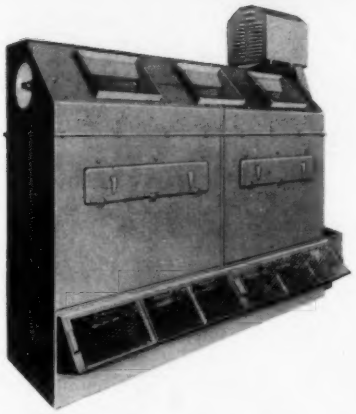
Yorx Embassy Air Conditioners, ducts optional, provide residential or commercial cooling, which varies with load for economy. Capacities: Packaged water cooled systems—3 to 33 tons cooling; 34,000 to 645,000 Btuh heating.

IONING and CONDENSING UNITS

aid of Air-Cooled, or Evaporative Condensers

YORK ECONOMIZERS

York Economizers (evaporative condensers) combine the advantages of a water-cooled condenser and cooling tower usually at less cost, less space, less weight. Install indoors or out. Sectionalized. Capacities: 5 to 150 tons.



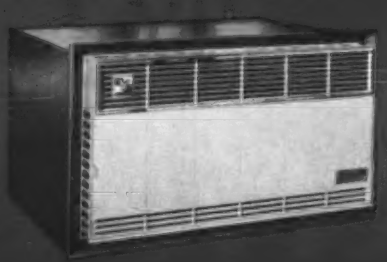
"Balanced Cooling" for complete all phases of system

YORK PATHFINDERS

York Pathfinders with twin compressors, are designed for residential and commercial air conditioning. Twin compressors have step sequence for trouble-free operation and economy. Air cooled. Capacities: 2 to 4 tons.

YORK TWINLINES

York Twinlines provide residential, commercial cooling. Remote heat exhaust section goes outside the building, cooling coil above furnace or in ductwork. Two, step-start cooling systems save up to 30% on operating costs. Capacities: 3 to 5½ tons.



YORK ROOM AIR CONDITIONERS

York Room Air Conditioners provide cooling and heating, with automatic temperature control. Fresh-air intake, and exhaust. Capacities: 9,500 to 18,000 Btu cooling.

Wherever you go... THOSE WHO DEMAND THE FINEST IN AIR CONDITIONING AND REFRIGERATION CHOOSE YORK

Air Conditioning

Allen Manufacturing Co.
Bloomfield, Conn.

Birch Towers
Ft. Lauderdale, Fla.

Carson, Pirie, Scott & Co.
Chicago, Ill.

Conrad Hilton Hotel
Chicago, Ill.

Flick-Reedy Corporation
Bensenville, Ill.

Foley's
Houston, Texas

Fulton National Bank
Atlanta, Ga.

Illinois Power Co.
Decatur, Ill.

Insurance Company of North America
Richmond, Ind.

Maryvale Shopping Center
Phoenix, Ariz.

Mile High Center
Denver, Colo.

Nationwide Inn
Columbus, Ohio

Statler-Hilton Hotel
Boston, Mass.

Sylvania Electric Products Co.
Amherst, N. Y.

3 Penn Center Plaza
Philadelphia, Pa.

300 Park Avenue
New York City

Refrigeration

Greensboro Ice Cream Co.
Greensboro, Md.

John Morrell Co.
Sioux Falls, S. D.

Pacific Fruit Express Co.
Ogden, Utah

Shell Oil Co.
Deer Park, Texas

Sinclair Refining Co.
Wellsville, N. Y.

Wissahickon Skating Club
Philadelphia, Pa.

Wyandotte Chemicals Co.
Geismar, La.

Factory Branches and Distributor Engineering and Sales Offices Throughout the Country

CALIFORNIA
Los Angeles 58, 5051 Santa Fe Ave.
San Francisco 3, 1275 Folsom St.

COLORADO
Denver 6, 2928 East Second Ave.

DISTRICT OF COLUMBIA
Washington 6, 1014 Dupont Circle Bldg.

FLORIDA
Fort Lauderdale, P.O. Box 8053
Jacksonville, P.O. Box 8288

GEORGIA
Atlanta 24, 525 Plaster Ave., N.E.

ILLINOIS
Chicago 48, 5950 West Touhy Ave.

INDIANA
Indianapolis 20, 2238 East 61st Place

LOUISIANA
New Orleans 12, 348 Baronne St.

MARYLAND
Baltimore 2, 1019 Court Square Bldg.

MASSACHUSETTS
Boston 16, 31 St. James Ave.

MICHIGAN
Detroit 38, 14385 Wyoming Ave.

MISSOURI
Kansas City 11, 3142 Broadway
St. Louis 2, 119 South Eleventh St.

NEW YORK
New York 17, 100 East 42nd St.
Rochester 5, 471 St. Paul St.

NORTH CAROLINA
Charlotte, 501 Morehead

OHIO
Cincinnati 2, 659 East Sixth St.
Cleveland 5, 3121 Euclid Ave.
Columbus 24, 1273 Carbone Drive

PENNSYLVANIA
Philadelphia 2, Three Penn Center Plaza
Pittsburgh 22, 1613 Penn Ave.

TEXAS
Dallas 2, 1707 Cedar Springs Road
Houston 1, 2201 Texas Ave.

$9.32 per Sq. Ft. Construction Cost

Believe Mechanical, Design Features of Air Conditioned School Will Save $110 Monthly

HOUSTON, Texas—Construction will start immediately on what is described as the first completely air conditioned elementary school in southeast Texas, a $364,524 project for the Dayton Independent School District.

The school, to be completed by next September, has attracted wide attention from school officials, architects, and engineers for several unusual mechanical and architectural design features.

Its individually controlled zone system of gas heating and air conditioning is believed to be the first of its kind to be adopted for a major school project in the nation.

The building's windowless, compact design and the use of a new type of heating-cooling system resulted in a square-foot construction cost of $9.32, said to be unusually low for a project of this nature. The designers also say substantial savings in construction and maintenance cost have been obtained.

Architects for the Dayton Elementary school are Wylie W. Vale, A.I.A., and E. D. Carter and E. A. Wilpitz, Associates, of Houston; structural engineer is William S. Merliss & Associates of Houston; Reese J. Brentzel is mechanical and electrical engineer. General contractor for the project is Glenn H. Engbrock, Inc. of Houston.

In citing the $9.32 per square foot construction cost, Brentzel said.

"The saving is enough to pay the operating costs of the heating-air conditioning system. The design has cut down considerably on corridor length, piping, exterior walls, and other construction factors.

"We estimate that the use of this type of gas heating and cooling system will save more than $110 a month in utilities costs alone for the life of the building, as well as substantially reducing other maintenance and operating costs."

This individual temperature control is obtained by circulating chilled water through a natural gas engine-driven reciprocating compressor. Hot water circulated through the system is obtained from the engine-jacket, as in the heating systems of most water-cooled automobiles.

The automatic heating and air conditioning system circulates chilled or heated water independently in office, classroom, and cafeteria-auditorium areas. All these areas have individual control, and simultaneous heating and cooling is available in different areas, Brentzel said.

The system is automatically controlled by modulating thermostats in each room.

Since the building is windowless, an emergency lighting system is provided for all areas, with an emergency generator for stand-by, in case of a power failure.

In addition, all classrooms will have clocks, public address speakers, telephone-type teacher intercommunication systems, and individual wash basins with drinking fountains.

"The design adds flexibility to the classroom arrangements for visual aids and seating," Brentzel pointed out. "There is more blackboard space, and the children can be seated in any manner the teacher desires."

The fireproof building was designed with concrete frame and slab foundation, and double masonry walls, the outside walls being finished with warm buff face brick. It was planned with more than 39,000 sq ft of floor space for 26 classrooms, offices, and a cafeteria-auditorium.

Corridors, rest rooms, kitchen, and the cafeteria-auditorium will be floored with terrazzo, and the walls finished with glazed tile. Two covered unloading areas have been provided, and the project includes a paved parking area.

The mechanical contractor for the Dayton school is Williamson Plumbing & Supply Co. of Liberty; the electrical contractor is Gilliland Electric Co. of Liberty.

To Air Condition Residence Hall At U. of Alabama

TUSCALOOSA, Ala. — The $1,867,000, six-story men's residence hall to be erected on the University of Alabama campus here will be air conditioned.

Housing 532 students, the building will include a music room, library, conference clubroom, co-ed snack bad and lounge, barber shop, laundry, and cafeteria with food service facilities for 750 persons. Also, there will be a private dining room and apartment rooms for the resident manager and social director.

The structure, designed by Birmingham architect Wilmot C. Douglas and Tuscaloosa architect Carl M. Moseley, Jr., is scheduled to be completed in time for the 1961 fall term.

How settings are locked

Where it is desirable to lock settings, installer removes cover and pushes out factory-installed key "B" from each adjusting knob. This disconnects knob from adjusting shaft. Then, user may insert special key "A" (supplied for key chain use) through knob slot and turn to make desired settings . . . remove key and thermostat is locked as adjusted.

Take your choice...heating, cooling or heating-cooling...each features unique, easy-to-use, locking-type knobs

Here's the line voltage thermostat that has "everything" desired for accurately controlling temperature in motels, schools, offices and similar installations.

It has easy-to-read temperature and function selector dials. It has an accurate bimetallic thermometer with vertical dial. It has exclusive, locking type adjusting knobs, attached to cover but connected to adjusting shafts by factory-installed "keys" within the knobs. It has a unique, built-in but concealed adjustable high limit stop for temperature dial. It has an unusually sensitive element and mechanism which provide low operating differential at all voltages and all amperages within its rating. It has easiest "field wiring" ever... simply connect to large terminals *on back of thermostat*. And, it has modern "thin-line", compact styling. Learn more about this new thermostat... write to the Penn factory for Bulletin 3233.

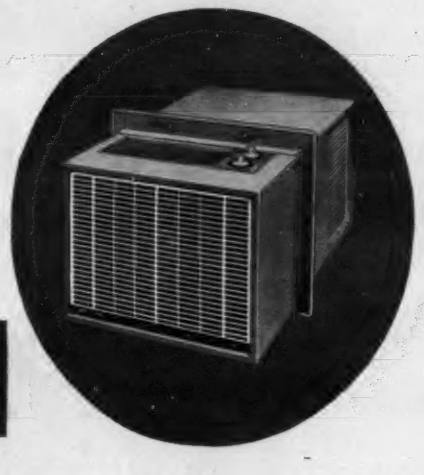
PENN CONTROLS, INC. Goshen, Indiana

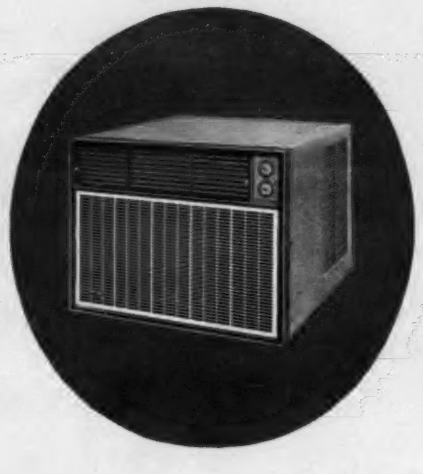
EXPORT DIVISION: 27 E. 38th ST., NEW YORK, N.Y.

AUTOMATIC CONTROLS FOR HEATING, REFRIGERATION, AIR CONDITIONING, APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES

STOP!

LOOK!





and liven up your profits with

Amana

ROOM AIR CONDITIONERS

Amana offers quality-built, feature-packed Room Air Conditioners for every type and size of home or small business. 24 models that range from 6,600 BTU to 23,000 BTU capacity for every possible installation: thru-the-window, within the window line, thru-the-wall or in casement windows. All have automatic temperature control. All are performance-proved for peak circulating, cooling and dehumidifying efficiency. Many available with Amana heat pump to heat as well as cool – automatically! There's a top-quality Amana Room Air Conditioner exactly right for every customer's need! And each one offers you an attractive, full-profit opportunity.

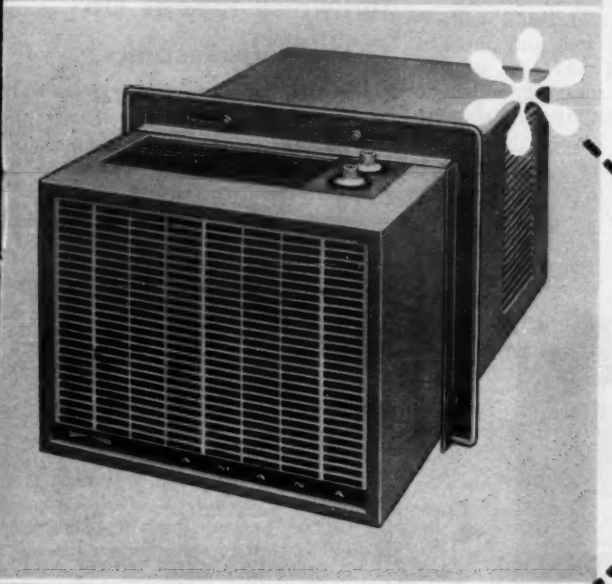
LOOK AT THE
EXTRA FEATURES
Amana OFFERS
AT NO EXTRA COST!

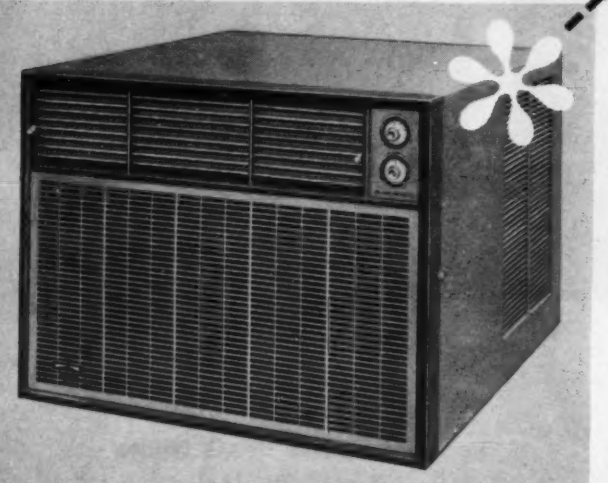
4-WAY PROTECTION AGAINST RUST – In place of cold rolled steel, Amana's fabricated steel parts are made of zinc-coated steel that is first bonderized, then finished with two coats of baked on, special formula Epoxy Resin enamel.

QUIET OPERATION – Exclusive Silent-Aire Turbine, welded construction, rubber mounted fan motor, spring mounted compressor and heavy Sound Barrier and Styrofoam insulation add to Amana's uniquely quiet operation.

FULL-POWER PERFORMANCE – The oversized cooling coils used are made by Amana to perfectly match the horsepower rating of the compressor giving every Amana greater efficiency and more BTU capacity to increase the amount of cooling.

CONVENIENCE – Air Deflector Grill insures complete air circulation. Permanent-type Filter is washable, traps pollen and dust, helps keep house cleaner. Amana units are styled to blend easily into any room.





Amana HAS NEW FEATURES, NEW MODELS TO HELP YOU SET A NEW SALES HIGH!

AMANA INSTANT MOUNT—fastest, surest installation...Amana's exclusive superior built-in mounting feature – Instant Mount – has two special adjustable panels that are completely weather-sealed and wind-proof – slide easily to fit any double-hung window from 28 to 40 inches wide. Instant Mount makes Amana quickly removable for use in other rooms or for winter storage.

AMANA CASEMENT WINDOW AIR CONDITIONER—from carton to cooling without an installation kit! The Amana Casement Window air conditioner comes ready to install without remodeling. Customer simply removes it from carton, slides it in window after glass has been removed and adjusts four thumb screws to lock it in place. Features over-sized cooling coils, thermostatic control and two speed fan for peak cooling performance.

AMANA 23,000 BTU CAPACITY AIR COMMAND, 250 Series – the *single* unit that provides multi-room cooling – more cooling than many "central" air conditioners. "King-size" cooling yet it is exceptionally quiet and fits easily into double-hung windows as small as 28 inches. Ideal for multi-room cooling, apartments, or small businesses.

DON'T FORGET!

Amana makes first-line quality Central System Air Conditioning, too – available also with Amana Heat Pump that automatically heats as well as cools! A single unit that provides automatic whole-house heating in winter and cool, refreshing air all summer long. The Amana system is electric and fully automatic. It provides clean, safe, economical service. Amana Central System Air Conditioning with Heat Pump is available in a full range of sizes for every home requirement.

TAKE ADVANTAGE OF Amana's PRE-SEASON PLAN

Amana's Pre-Season Plan is tailor-made for the alert dealer who wants to do a big-volume, big-profit room air conditioner business in spring '61—*AND* compete in price. Amana offers a decidedly different kind of pre-season plan—a complete selling and merchandising program. Plenty of dealers already have placed their spring orders—how about you? Better look into it right now!

Got the Wanderlust?

Let Amana take you on a fabulous luxury vacation trip to Europe, Mexico, Bermuda. Find out how easy it is to qualify, how many other big advantages you'll enjoy when you participate in Amana's Pre-Season Plan.

Call your Amana distributor today and order your Amana Room Air Conditioners for spring '61 YOU'LL GET PRE-SEASON SAVINGS AND IN-SEASON PROFITS!

Amana adds Nation-Wide Television to its Promotional Program!

In addition to full pages in leading national magazines Amana adds nation-wide television! Amana products will be pre-sold for you coast-to-coast ON ABC'S POPULAR "CHAMPIONSHIP BRIDGE" featuring Mr. Bridge himself, CHARLES GOREN! Every Sunday afternoon. Consult local paper for time and station.

Amana®

Backed by a century-old tradition of fine craftsmanship

AMANA REFRIGERATION, INC., AMANA, IOWA

Redesigned Residential Compressor, New Fractional Hp Units Shown by B-W

EVANSVILLE, Ind. — New and redesigned product lines were introduced recently by the Evansville Div. of Bendix-Westinghouse Automotive Air Brake Co. when regional managers covering all areas of the United States, Canada, and Latin America gathered here for the annual three-day sales meeting.

Some of the products unveiled at the meeting were:

1. A complete line of medium temperature condensing units and motor compressors for commercial application.

2. A new line of milk cooling condensing units designed specifically for the milk cooling industry with larger condensers and receivers and other controls required by this industry. These units will be shipped fully charged with refrigerant.

3. The redesigned residential air conditioning compressor ranging in size from 2 to 4 hp. The new protective and design features incorporated in these compressors were explained to all the regional managers.

4. The new line of fractional horsepower compressors and condensing units. Plans were made to penetrate markets that heretofore have been unavailable to Bendix-Westinghouse.

With the addition of the new products, the Bendix-Westinghouse product line is now approximately three times as great as it was when the division was started in 1956, it was pointed out.

Most of the sessions during the meeting were devoted to technical developments affecting the air conditioning and refrigeration motor compressors and condensing units built in Evansville.

"The regional managers were given a thorough insight into all of the design considerations that went into the new product line," it was noted. "Considerable time was also devoted to the engineering application of the condensing units and motor compressors."

Frank Haag, general manager of the Evansville Div., described in detail the progress the division has made during the past four years from the standpoint of sales and profit.

He indicated that the board of directors was very enthused with the progress made to date and that the forecast for the future looked very gratifying.

NEW COMPRESSOR MODELS are previewed by Bendix-Westinghouse Evansville Div. regional managers at headquarters sales meetings. New lines included residential air conditioning compressors in 2 to 4 hp range, new line of medium temperature units for commercial application, and a new line of fractional horsepower compressors.

Don Wood, general sales manager, traced the sales growth of the division and indicated that it had been approximately 40% each year. He also indicated that within the next three or four years, the volume of the division will be approximately two and one-half times what it was last year.

"The sales meeting ended on a very optimistic note with an address by the president, Willard Paine, who indicated some of the plans for capital expenditures to further strengthen the division," it was reported.

Burnworth Heads Up Yucca Wholesalers

ALBUQUERQUE, N. M. — Dewey Burnworth has been elected as the new president and general manager of Yucca Wholesalers, Inc. here, it was announced recently.

Burnworth started in the air conditioning business in Roswell, N. M., doing sheet metal, warm air heating, and evaporative air conditioning with the retail trade. This was in 1946 after serving with the Army for four years. He is still active in the Army Reserve program holding the rank of major.

In 1950 he sold his interests in Burnworth-Coll, Roswell, to his father, brother, and brother-in-law to continue his education at the University of New Mexico. In 1954 Burnworth took over the Carrier distributorship for New Mexico and El Paso, Texas. This operation was then sold to Wood-Leppard Air Conditioning of Houston, Texas.

Yucca Wholesalers has been in the refrigeration business since 1948 and has grown steadily under the management of Leo Zimmerman who is retiring from active management of Yucca. Products handled by Yucca include Tecumseh, Kramer Trenton, Kold-Hold, A-P valves, Ranco, Virginia Smelting, and Detroit valves.

Stephens Heads Lennox Decatur Div. Sales

MARSHALLTOWN, Iowa — Lennox Industries, Inc. announced the promotion of Robbie L. Stephens to a newly-created post, sales manager, at the Decatur, Ga. headquarters of the company.

R. L. Stephens

Until his recent transfer, Stephens has been manager of air conditioning at Lennox-Ft. Worth, a post he held since 1955.

BOHN

AIR COOLED CONDENSERS END WATER PROBLEMS!

Horizontal Air Flow

Vertical Air Flow

Sacramento Supermarket Saves $200 a Month in Water and Sewerage Bills Alone!

Water in Sacramento, California is hard and it's costly! Arata Brothers Supermarket solved this problem by changing from water cooled condensers to 7 Bohn Air Cooled Condensers. The result was lower maintenance and lower operating costs ... with savings of $200 monthly on sewerage and water bills alone. More importantly, the Bohn Air Cooled Condensers maintain even temperatures in the store's refrigerated equipment *at all times of the year!* Even a high temperature of 114° recorded in 1959 was easily handled by the Bohn Air Cooled Condensers! Whether it's hot or cold, Bohn controls adjust automatically to seasonal weather changes and maintain proper head pressure at all times.

For low first cost... low operating and maintenance costs, the answer is Bohn Air Cooled Condensers... available in horizontal models (deflectors optional) and in low-silhouette vertical models.

2 through 60-ton sizes.

SEE OUR EXHIBIT Booth #606

BOHN

Buy the known line... the BOHN line

ALUMINUM & BRASS CORPORATION

Danville Division • Danville, Illinois

MINERALLAC PERFORATED STRAP

Versatile Hanger Iron

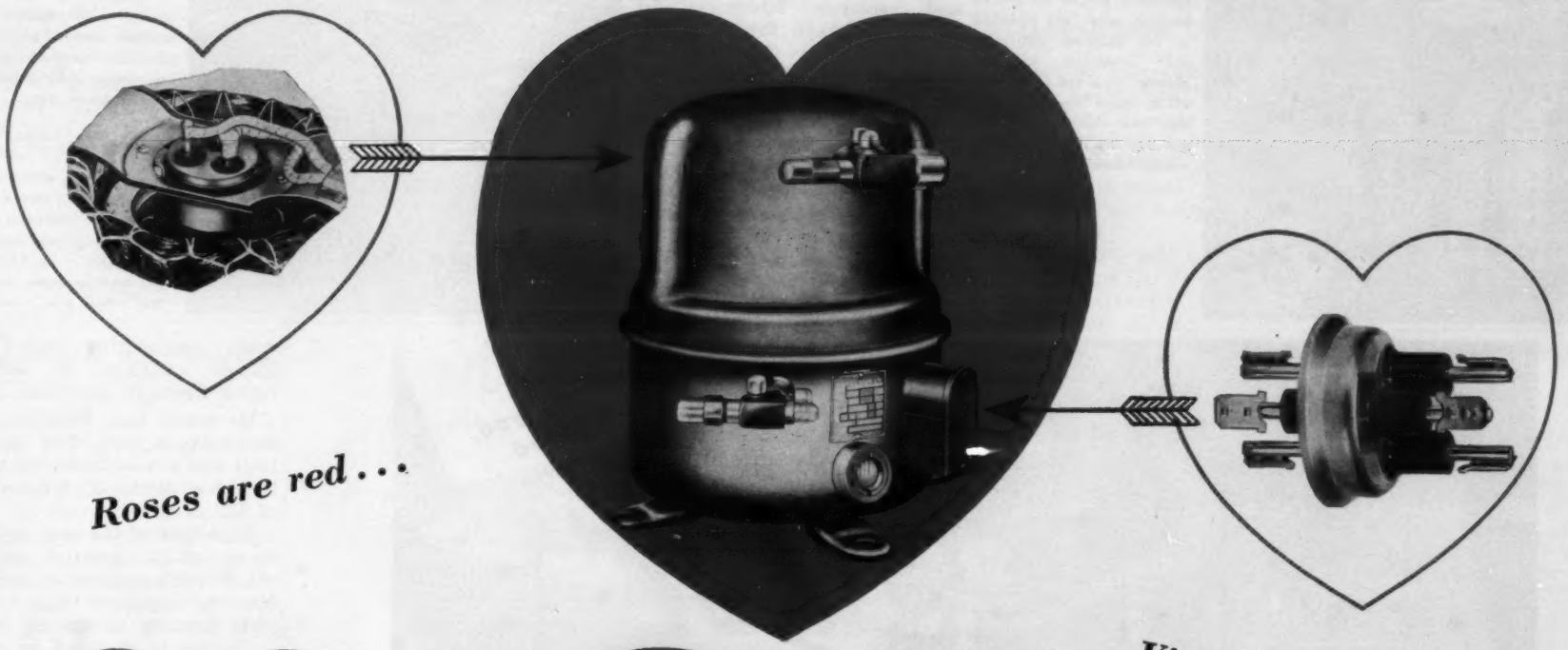
Safely supports hanging pipes, conduits and cables up to 500 lbs. ¾ in. 20 gauge electro-galvanized steel. ¼ in. holes on ½ in. centers. Various lengths available. *Send for literature.*

MINERALLAC ELECTRIC COMPANY

25 N. PEORIA ST. • CHICAGO 7, ILL.

A VALENTINE DAY GREETING TO

Copeland®



Roses are red . . .

Violets are blue . . .

Copeland likes Fusite . . .

We like them, too!

It's really not surprising that Copeland uses Fusite glass-to-metal Terminals in their motor-compressors. Fusite Terminals are S.O.P. for practically the entire industry.

But we take special pride in showing just how many *different* ways Copeland has made use of our unique ability to fuse glass and metal to fit custom requirements. We show both the Copelaweld® welded unit and the Copelametic® accessible hermetic unit.

In the Copelaweld a special Fusite Terminal seals the internal inherent motor protector as furnished by Metals and Controls Division of Texas Instruments, Inc. A typical integral horsepower type Fusite Terminal with copper-cored, spade connector electrodes and extended glass is used.

The Copelametic also includes a Fusite Terminal on motor protector, a Fusite integral horsepower terminal featuring bimetal straps for use with phenolic connector block and a Fusite one-piece sight glass with fused lens.

Copeland doesn't have a jealous bone in their body. We'd like you to be our Valentine, too.

INSULATE ELECTRICALLY · GLASS TO METAL · FUSITE TERMINALS PROTECT PRODUCT PERFORMANCE · SEAL HERMETICALLY

Dept. R

THE FUSITE CORPORATION

6000 FERNVIEW AVE., CINCINNATI 13, OHIO

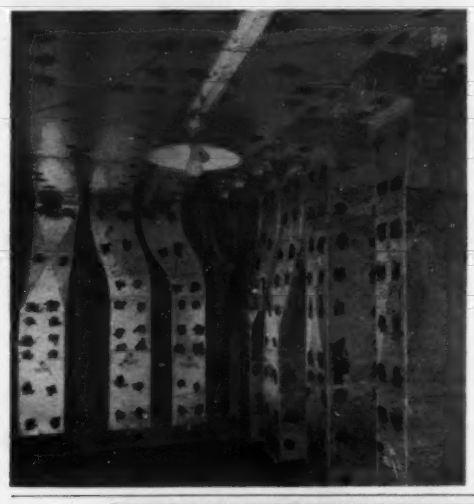
Woodford Mfg. Co., Versailles, Kentucky.

In Europe: FUSITE N. V. Koningsweg 16, Almelo, Holland

Fusite Gmb H, Diesselstrasse 5, Karlsruhe, W. Germany

System Modulates Heat, Percent of Fresh Air

All Gas Heating, Cooling System Serves As Laboratory for Controls Manufacturer

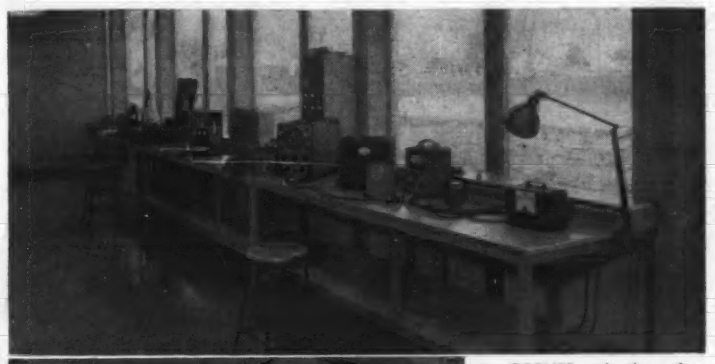


HEATING DUCTS for the 18 heating zones are installed in the building slab and are connected to the plenum in a sub-floor level pit to insure ease of drainage and maintenance. The pit also facilitates experimental installation of new controls.

SOUTHFIELD, Mich.—Maxitrol Co., manufacturer of gas pressure regulators and "Selectra" comfort controls for gas furnaces, has moved from Detroit into a new general office and research laboratory at 23555 Telegraph Rd. in suburban Southfield.

Included in the new 24,000-sq ft structure are a model making and experimental shop; a fluid mechanics laboratory for testing to pressures of 20 psi and flows up to 25,000 cu ft/hr; and a controls research laboratory fully instrumented for electronic measurements.

The colorful new single floor building provides four times as much engineering space as former quarters in Detroit, Frank Kern, Jr., president, said.



A CORNER of the electronics lab, where new printed circuit and transistorized comfort controls are under development, is shown here.

MAXITROL's "heating laboratory" is its own gas-fueled heating and air conditioning plant, shown here. Maxitrol's engineers designed the face and bypass system with 18 separate heating zones to job-test many new products.

He noted that Maxitrol still maintains a tool shop in Detroit and a manufacturing plant in Colon, Mich., 30 miles south of Battle Creek.

Highlight of the new building is an all-gas heating and air conditioning system designed by Maxitrol engineers to be a complete heating laboratory itself.

Cooling is provided by a 25-ton Arkla chiller.

Air Distribution Is Face, Bypass System

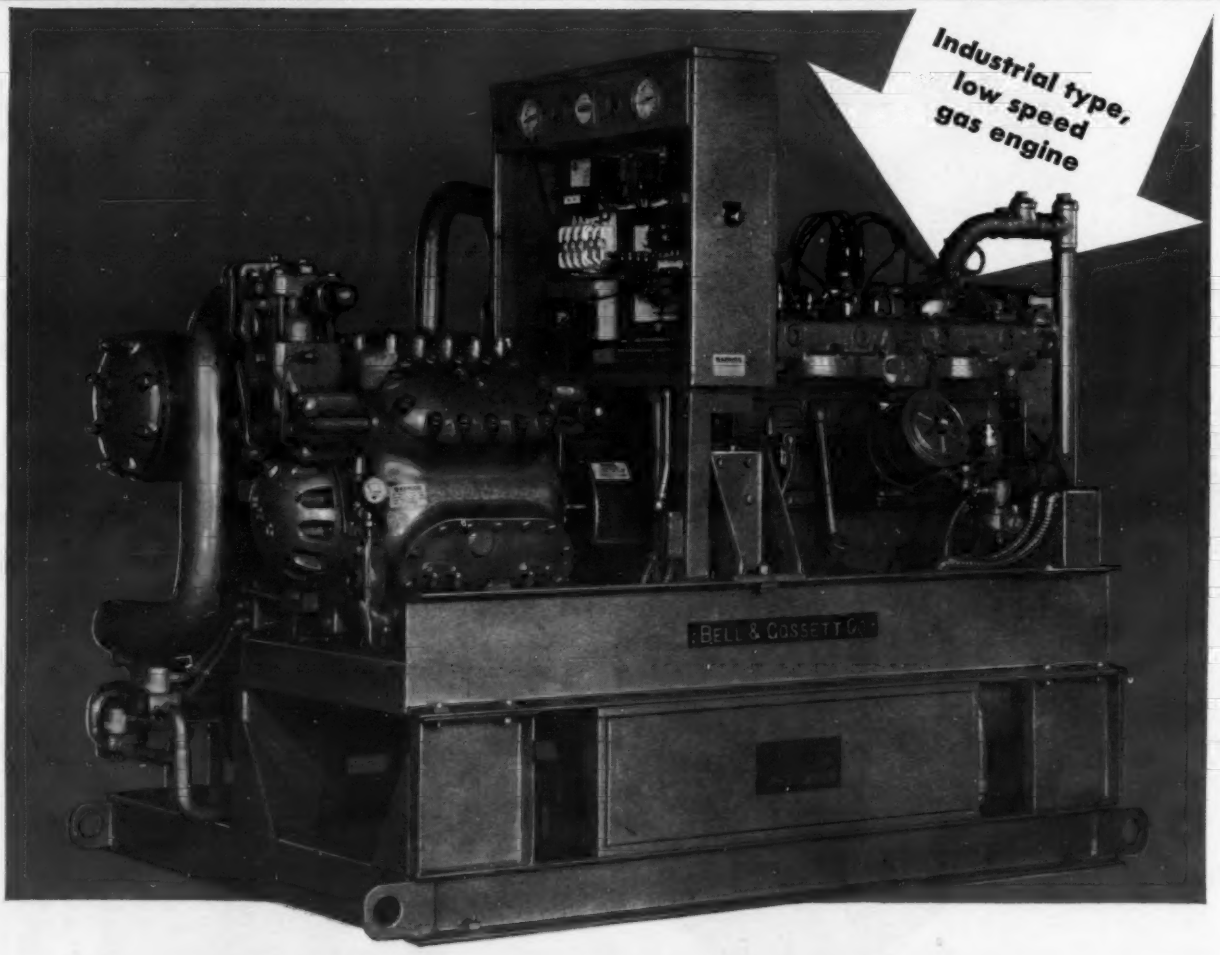
Air distribution system is fundamentally a face and bypass system. It has 18 separate zones, each with its own mixing plenum and proportioning controls operated by Selectra electronic modulation.

All air is filtered electrostatically with a Trion unit. Diffusion is through perimeter baseboard panels with high sidewall return.

With this system, Maxitrol engineers will job test new models of Selectra systems as well as other gas and comfort controls under development, Kern said.

The system is so sophisticated that, in addition to modulating heat, it will also modulate the proportion of fresh outside air to return air, depending upon inside-outside differential temperatures, he added.

The experimental shop includes a small testing chamber, measuring 6 by 7 ft, inside dimensions. This chamber is used to calibrate Selectrastats



NOW GAS ENGINE POWERED...

B&G Package Liquid Coolers, Condensing Units and Engine Compressors are now available as "package" units powered by integral gas engines. These are the only units with all major components (except the engine) *designed, built and guaranteed by one manufacturer.*

B&G gas powered units are equipped with an industrial type, low speed gas engine developed for minimum oil and fuel consumption. The engine operates at a maximum of 70% of rated horsepower, for longer life and minimum maintenance.

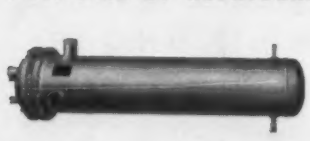
Additional power plant features include an engine oil auxiliary tank that permits 2000-hour operation without adding oil...automatic and adjustable engine warm-up...100% no-load start at each start-up...automatic choke...capacity control effected by automatically varying engine speed in addition to varying the B&G compressor unloading.

A particularly outstanding feature of all three units is the compressor, an achievement in advanced design and precision manufacture. All compressors have *one* bore—a few interchangeable parts service all units.

B&G "package" cooling units incorporate many special features as standard equipment which in competitive units are "extras" or are simply not available. Send for descriptive literature.

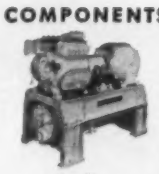
BELL & GOSSETT
COMPANY
Dept. *GN47*, Morton Grove, Illinois
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

A FULL LINE OF REFRIGERATION AND AIR CONDITIONING "PACKAGES" AND COMPONENTS


B&G Evaporator

B&G Centrifugal Pump

B&G Condenser


B&G Condensing Unit

Handy Tube Bender

Smoothly Bends any pipe or Tubing 3/8"-1 1/8" O. D.

• Just a twist of the wrist assures perfect, even bends — right angle, any angle, U and offset. Save enough on ONE job to pay for your HANDY BENDER.

See your supply house—or write for free folder today.

HOLSCLAW BROS., INC.
428 N. Willow Road • Evansville, Indiana

and control systems on experimental models, Kern explained.

By operating a 2-ton cooling unit continuously and modulating a heating unit, Maxitrol can obtain any desired inside temperatures and hold them to within .2°, he added.

Perforated board on two walls of the chamber give draft-free even air flow throughout the chamber.

The general office has been equipped with the latest communication and order processing equipment, including direct teletype to the Colon plant and a closed circuit TV for monitoring building entrances. A special area is provided for product display.

The building, constructed in 4-ft modules to ease future space use changes, is brick with curtain walls of glass and porcelainized steel. Provision is made for future expansion of two wings. Gas lights illuminate the entrances and parking areas.

The company was founded as Detroit Gas Regulator Co. in 1930. It introduced the trade name Maxitrol in 1949 and changed its name to Maxitrol in 1953.

In the past 13 years, Maxitrol has introduced straight-through flow regulators, rubber seat poppet regulators, hermetically sealed regulators, and, more recently, Selectra electronic modulation for gas furnaces.

Most of its business is OEM to gas furnace manufacturers, though some is obtained in the replacement furnace market, Kern indicated.

Pacific Industries Buys Grove Furnace

SAN FRANCISCO—The purchase of Grove Furnace Co., Garden Grove, Calif., for an undisclosed amount in a cash transaction was announced by Pacific Industries, Inc.

Henry L. McIntyre, Pacific Industries president, said Grove Furnace products would augment those of Custom-Aire Products Div. of Pacific Industries. Grove Furnace makes air conditioning units, gas-fired furnaces, and heat pumps. Custom-Aire Products produces gas-fired forced air furnaces, space heaters, and recessed wall heaters.

Grove Furnace will be operated as a branch plant of Custom-Aire Products.

Acme Industries Establishes New Tampa, Fla. Office

JACKSON, Mich. — In conjunction with Acme Industries expansion in the Southeast, initiated by the opening of a new plant facilities in Greenville, Ala., Acme has established a new regional office in Tampa, Fla.

This move to strengthen sales engineering services with direct factory representation in the the area was announced by P. A. Weatherwax, Acme executive vice president.

Howard W. Ward, sales engineer from Acme's Chicago office, has been appointed to head up the new office.

2 Wholesalers In New Orleans Merge

NEW ORLEANS — A large wholesale firm handling heating equipment has been formed here, merging the operations of two smaller, long-established companies.

The new firm is Cahn Bros. & Redmond, Inc., now servicing the New Orleans area with heating apparatus, sheet metal, plumbing equipment, and building specialties.

Parent companies were B. V. Redmond & Sons, Inc., operating in New Orleans since 1897, and Cahn Bros. & Ryder, Inc. Firm is located at 428 S. Peters.

Officers of the new organization are Marion A. Loisel, president; M. Emmett Toppino, executive vice president and general sales manager; Louis J. deLassus, vice president; and John L. Hooper, treasurer.

4-Man Licensing Board Authorized In Louisiana Parish

CHALMETTE, La. — Val Riess, president of the St. Bernard Parish police jury, has been named to appoint members of the newly-formed four-man board to regulate and license air conditioning, heating, and refrigeration contractors.

Action giving Riess this authority came at a meeting of the police jury, local governing body that passed the licensing code in December. The new law went into effect recently.

Comprising the four-man board will be a chief inspector, a union refrigeration and air conditioning contractor, a non-union contractor, and the parish engineer.

The code applies to all new systems installed, to the reinstallation of used equipment, to all existing systems, and to all alterations and additions.

In adopting the code, the New Orleans suburban area became the second parish (county) in Louisiana to accept an air conditioning and refrigeration licensing law. The other is Jefferson Parish, also bordering New Orleans.

AGA Approves Reznor DS Series Furnaces For Downstream Use

MERCER, Pa. — The American Gas Association has given its approval to downstream installation of Reznor Mfg. Co.'s DS Series modular duct furnaces in year-round packaged aid conditioning systems, Reznor announced.

The company said such AGA approval requires (1) use of corrosion resistant materials in heat exchangers, carryover parts, and pilots, and (2) provision for proper elimination of condensate.

"Downstream installation of duct furnaces benefits the installer and user because of easier maintenance and the comparative simplicity of such installations, eliminating the necessity of installing special by-pass ductwork to isolate the furnace when it is not in operation during summer months.

"In addition, such installation allows re-heating in circumstances where the tempered air first must be chilled for removal of moisture."

Reznor's DS Series duct furnaces are available in capacities of from 150,000 to 300,000 Btu.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Newest in **electric** heating and cooling

America's First Bonded Heat Pump

BOND ISSUED BY TRAVELERS INDEMNITY CO. HARTFORD, CONN.

Engineered with Precision in the Coleman Tradition

Now, Coleman takes the proved principle of air-to-air heating and cooling and expresses it in a compact, all-electric Heat Pump. COOLS in summer. HEATS in winter. In all seasons it assures maximum performance and economy... using only electricity and air.

Twin components are pre-engineered for simple, low-cost installation. Indoor unit is "multi-positional"—fits any type of air delivery system.

It's America's most advanced, most dependable Heat Pump! And as a sales clincher, you have the Coleman warranty bond – the industry's ONLY bond-backed guarantee. Ask your Coleman distributor or write—

The Coleman Company, Inc. / Wichita 1, Kansas

Coleman builds the most complete and only bonded line of heating and air conditioning. Investigate!

Van Cleave Tells NCRSA

You Are Mismanaging Your Business If You Aren't Making Profit on Service Dept.

NEW ORLEANS — "If you are not making a profit in your service department, you are mismanaging your business," Foster Van Cleave, president of the Friedrich Refrigerator Co., Fort Worth, Texas, advised distributors attending the 14th annual convention of the National Commercial Refrigerator Sales Association here recently.

To do so, however, takes close executive supervision, he emphasized.

Purchasing

Starting his discussion with the purchasing function, he told the distributors that "any time you purchase something, you are spending money—your money. Always remember that.

"Purchase only what you need, as you need it. Don't overstock. Keep a good healthy turnover on every item in your inventory. Keep every item cataloged on inventory cards. Take inventory at least twice a year.

"Purchasing is a function that requires close executive supervision. It cannot be left in the hands of an employe, however trusted that employe may be.

"Human beings are 'collectors' by nature. We all have a tendency to over-supply ourselves with physical objects. The fear of shortage confronts us all, therefore we store up things we don't need and will never need.

"This fact holds true in most refrigeration service departments. Servicemen like to keep their trucks loaded to the gill with copper tubing, solder, tools, refrigerant, and spare parts.

Oversupply of Service Inventory Dangerous

"An over-supply of service inventory is dangerous. Oversupply invites waste, loss, and theft. It encourages loose control. It takes money out of your pocket. This is why I maintain that purchasing is a function that requires close executive supervision.

"On major jobs, here's how I would recommend handling purchase of necessary service equipment. I would sit down with my service manager, with an equipment blueprint of the job before us.

"We would then figure out, case by case, exactly what materials we would need to install the equipment in the store. No more, no less.

"Then I would order the materials, or, better still, I would order what I didn't already have in my inventory stock.

"This sort of purchasing eliminates many headaches; it gives you a written report on what materials the service department is using on the job; it eliminates waste and duplication; it protects you on your quantity discount in buying the materials for one job at one time.

"Since most commercial refrigeration companies secure service equipment from only two or three sources—factory and local supply houses—it is comparatively easy to pick up the telephone and order what one needs in a hurry. Purchase orders should always be used, even for the smallest items.

"Again, I want to emphasize this point: *purchase only what you need, as you need it.* The only exception to this rule is in the purchase and stocking of minor service parts and equipment—things one uses every day—items that have a huge turnover.

"If you should live in a remote area, far from normal supply channels, you might have to make a few exceptions to this policy.

Profit on Service Should Average 10%

"Ideally," Van Cleave continued, "the average refrigeration service department should bring in signed service billings for 25% of the company's overall business. This percentage should include complete installation costs, including labor and parts, and warranty.

"Markup on service costs should average from 30 to 35%. Profit on service should average out 10%.

"If one will watch his buying, keep a close watch on inventory control, properly route and supervise service personnel, watch billings and collections, then there is no earthly reason why a service department can't earn its own way and show a profit to boot.

"After all, you are *selling service* as well as *equipment. Why not realize a profit on both?*

Keeping Servicemen Busy In Slow Season

"If you service an area where most of your sales are in totally new stores, your routine service calls may not exceed 15% of your total service billings.

"In this situation, your service department may suffer from lack of business during the winter off-season. You may be forced to cut back on your service personnel. But this is not the best thing to do. Good service personnel are difficult to obtain.

"There are two solutions to this problem.

"*Number One:* During the off-season, put your service personnel to work on reconditioning your old trade-in equipment. Get ready for the spring season.

"*Number Two:* Drum up new service business. Send out a 'Service Special' circular to all the food stores in your territory. Offer a low winter rate to all new customers. Quote prices. Give them a bargain, a few extras. You'll be surprised how many inquiries you will get on good direct mail advertising. Many companies reap a 10% return on every mailing.

"A few dealers have experienced difficulty in getting their servicemen to use their talents effectively in rebuilding or reconditioning used equipment.

"This is natural. Reconditioning a worn-out meat case or vegetable case is tedious and monotonous—such work takes

(Continued on Page 30)

ANOTHER

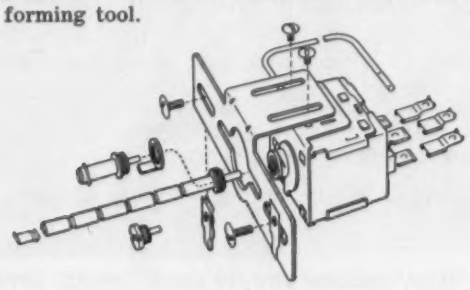
NEW RANCO REPLACEMENT

A11 (300 series) control *does the work of 54 different A11's now in use on refrigeration equipment*

Designed to help you make on-the-job control replacements fast and easy, this new Ranco A11 replacement adjusts to fit 54 separate control installations. The dial shaft extension is adaptable to any required length. Capillary tube can be shaped to any desired requirement with Ranco's new capillary forming tool.

Adjust the mounting brackets and add terminal adapter clips if necessary. What could be simpler?

Add this new A11 to your A30 replacement inventory and you're all set for more than 90% of your job applications without costly callbacks. With Ranco replacements, you know it will be done right the first time! See your local wholesaler now.



RANCO CONTROLS

Ranco® INCORPORATED

COLUMBUS 1, OHIO

In Canada: Ranco Controls, Canada, Ltd., Toronto 18, Ontario

McQuay

air·conditioning equipment

Including the
New Single and
Multi-Zone
Air Handling
SEASONMASTERS

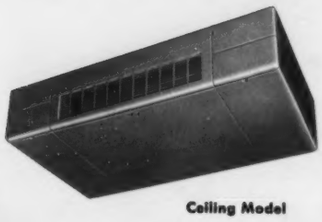
McQuay Means Quality

McQuay

SEASONMAKERS

McQuay offers the finest in remote type, individual room air conditioners for use with a central station heating and cooling system. Extremely quiet, the "Seasonmaker" is available in floor, basic, ceiling and hideaway models in a wide range of sizes to meet your exact requirements. Floor and basic models range from 220 to 1240 cfm, and ceiling and hideaway models range from 220 to 640 cfm. Write for catalog 715.

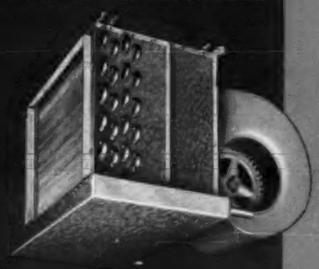
Hideaway Model



Ceiling Model

Floor Model

Basic Model



LARGE CAPACITY SEASONMAKERS

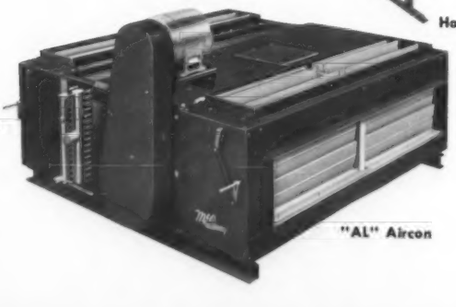
2 TO 10 TONS CAPACITY

Remote type ceiling suspended air conditioners for medium to large areas. Designed for fully recessed closet and false ceiling installations, or horizontally suspended in the conditioned space. The quiet, attractively styled McQuay large capacity "Seasonmaker" is available in four sizes of direct drive and five belt driven models. Write for catalogs 722 and 730.

Vertical Air Flow Aircon

McQuay

Horizontal Air Flow Aircon



"AL" Aircon

REMOTE TYPE AIR COOLED CONDENSERS

"AB" AIRCONS—Propeller fan types available in either horizontal or vertical air flow. Thirteen sizes each from 8 to 85 tons nominal capacity. Multiple installations make capacity unlimited. Write for catalog 629.

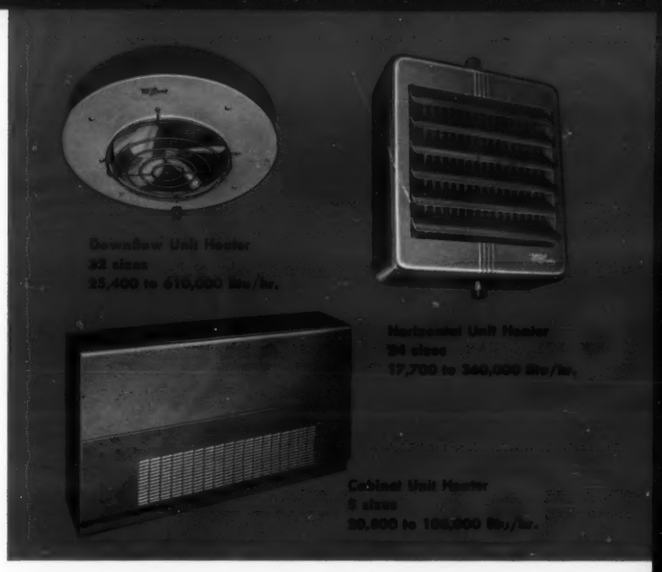
"AL" AIRCONS—Centrifugal fan types are designed for outdoor or indoor installations with or without duct work. They may also be used for exhaust ventilation and heating. Compactly engineered with a low silhouette, there is a wide range of unit and fan discharge arrangements. Write for catalog 635.

AUTOMATIC HEAD PRESSURE CONTROL
The McQuay type "AB" and "AL" Aircons are available with air side and refrigerant side head pressure control. The "AB" line is offered with opposed blade face dampers and corresponding controls for automatic operation.

McQuay

UNIT HEATERS

Horizontal, downflow and cabinet type unit heaters are available in an exceptionally wide range of sizes and capacities for either steam or hot water. Adjustable louvers and several varied styles of air deflectors are available. McQuay cabinet type unit heaters are available for floor, wall and ceiling applications; for exposed, semi-recessed or fully recessed installations. Write for horizontal unit heater catalog 323, downflow unit heater catalog 765, cabinet unit heater catalog 351.



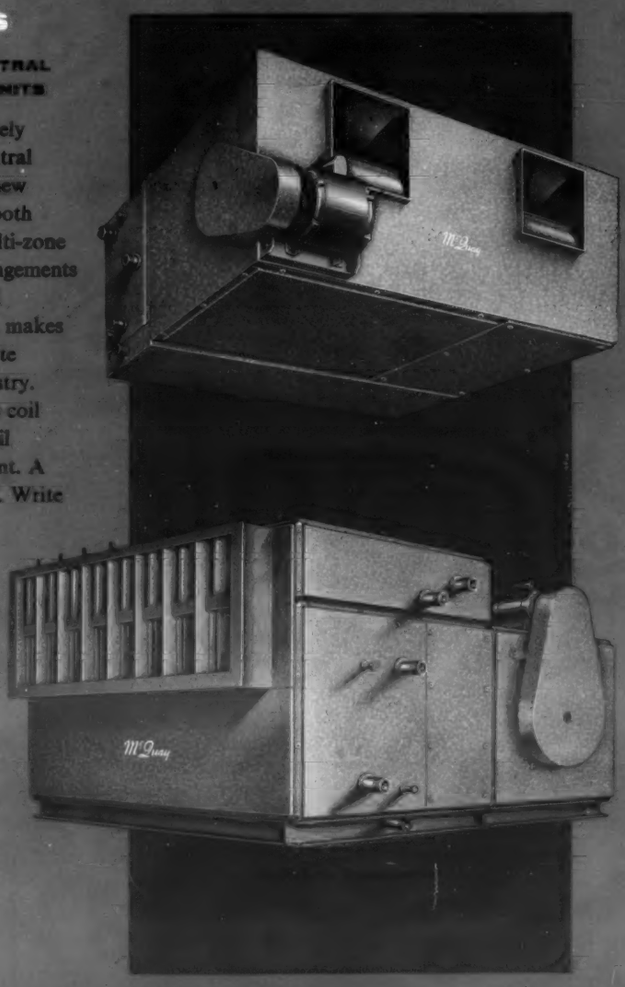
McQuay

SEASONMASTERS

SINGLE AND MULTI-ZONE CENTRAL STATION AIR CONDITIONING UNITS

McQuay proudly offers a completely new line of quality engineered central station air conditioning units. A new space saving design, available in both single zone draw through and multi-zone or double duct blow through arrangements in low pressure (up to 3" s.p.) and medium pressure (3" to 5½" s.p.), makes the McQuay line the most complete and versatile throughout the industry. Twenty-four models with multiple coil sizes insure the proper fan and coil combinations for every requirement. A full line of accessories is available. Write for catalog 560.

Vertical Seasonmaster



McQuay

Horizontal Heating and Ventilating Unit

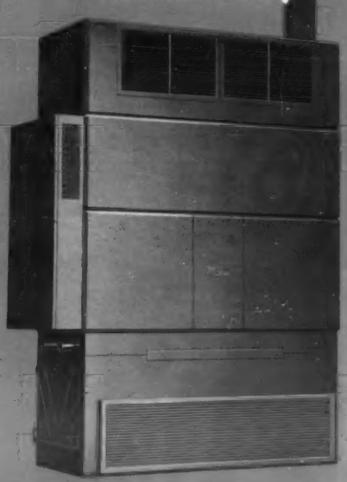
Vertical Heating and Ventilating Unit

"HC" HEATING AND VENTILATING UNITS

For heating and ventilating, McQuay offers the most flexible line available anywhere. Designed for horizontal, vertical, wall and inverted installations for use with or without duct work to fill the needs of every installation. For use with hot water or steam, the McQuay line offers the widest range of coil selection in the industry, with capacities ranging up to 48,000 cfm and 3,320,000 Btu/hr. Write for catalog 344.

McQuay

SEASONVENT



The McQuay Seasonvent is a deluxe large capacity heating and ventilating unit engineered specifically for school auditoriums, theatres and similar installations where quiet operation is a necessity. The Seasonvent is extremely versatile with nine sizes for low static applications (0" to 1¼" s.p.) and seven sizes for high static installations (1" to 2" s.p.), with capacities from 1250 to 15,000 cfm. Write for catalog 575.

McQuay

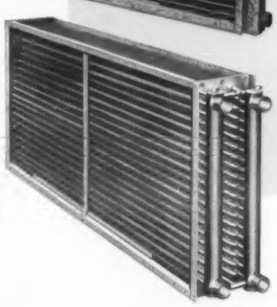
RIPPLE-FIN COILS

By the Nation's Largest Coil Manufacturer

A new type "5" coil design with a wide range of available fin spacings offers unlimited selection to meet all load requirements. This new design affords a new high in fin efficiency by attaining the highest heat transfer rate possible without excessive air friction. The combination of equilaterally staggered tubes and modified rippled fins produces maximum air turbulence, and intimate and prolonged contact between air and heat exchanger surface.

Direct expansion coils with pressure type distributors.

Pitched in casing steam coils. Easy installation and positive condensate draining.



Flow circuited water cooling and heating coils.

McQUAY, INC., 1600 Broadway N.E., Minneapolis 13, Minnesota

McQuay INC.

AIR CONDITIONING • HEATING • REFRIGERATION

DM—1961-2 Printed in U.S.A.

The inside story of . . .

SIX ADDED VALUES IN NEW GENERAL ELECTRIC FAN MOTOR

1
Tripled supply of oil, now standard on all models. Gives added assurance of long, maintenance-free life.

2
Improved bearing system means same motor rating can do a bigger job, or same job with longer life.

3
New integral insulation system improves motor life and dependability; reduces noise.

4
New punching design results in up to 20 percent higher operating efficiencies.

5
Alkanex* insulation on wire provides superior resistance to heat aging, giving longer life.

6
Multi-function Surge Test adds new levels of quality control to assure design excellence is retained through the manufacturing process.

*Registered Trademark of General Electric Co.

When you use a General Electric 51-frame motor on your refrigeration or heating equipment, you're making certain that the motor is a strong link in the reliability and life of your product. Motor performance can mean the difference between profitable repeat business and customer dissatisfaction with your products.

Specify the General Electric unit-bearing, shaded-pole fan motor which gives you six advantages detailed in the cutaway above. These six added values mean the 51-frame motor is designed to match and even outlast the life of other components in your equipment.

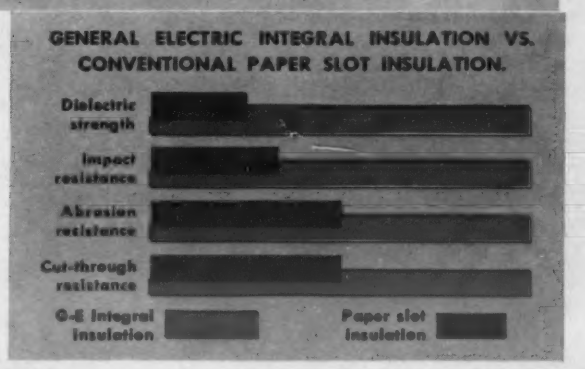
Four-pole, totally enclosed ratings are 1.5 to 16 watts, 60/50 cycles, 115 and 230 volts, single phase.

11-, 21-, AND 33-FRAME MOTORS ALSO AVAILABLE

Three other General Electric motor frame sizes are also designed for *heating and refrigeration applications.* The dependable, long-life 11- and 21-frame G-E shaded-pole fan motors give you a wide application range. Four-pole, totally enclosed ratings are: 60 cycles, 115 and 230 volts, single phase, 15 mhp to 1/20 hp (11-frame) and 1/15 to 1/10 hp (21-frame). Both frame sizes have integral insulation system for longer, quieter operation, and new punching design for up to 20 percent greater operating efficiency.

Rounding out the line is the Unitized† 33-frame motor with two-pole, open ratings of 0.75 to 15 watts, 60 cycles, 115 volts, single phase. Ask your General Electric Sales Engineer for more information on these four motors and how they can be applied to your refrigeration or heating products. Or write to Section 727-03, General Electric Company, Schenectady 5, New York.

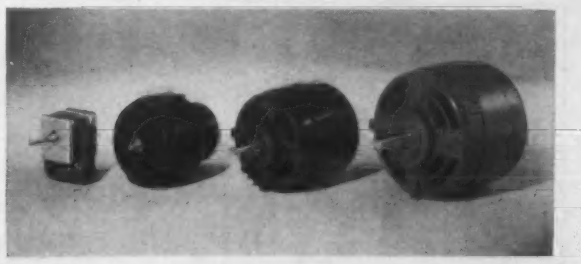
† Trademark of General Electric Co.



Superior on four important counts—that's the General Electric integral insulation system. Compared to conventional paper slot insulation, integral insulation has: four times the dielectric strength; three times the impact resistance; twice the abrasion resistance; and twice the cut-through resistance. And, unlike paper slot insulation, it is completely impervious to humidity. Integral insulation is standard on General Electric 33-, 51-, 11-, and 21-frame motors.

Progress Is Our Most Important Product

GENERAL ELECTRIC



General Electric's complete line of shaded-pole heating and refrigeration fan motors: (l. to r.) 33-, 51-, 11-, and 21-frame.

Service Dept. Should Show Profit--

(Continued from Page 24)

patience, unusual skill, and plenty of time.

"I would suggest this: tell your servicemen, when you hire them, if possible, that you expect them to learn how to rebuild old equipment during off-season periods.

"Teach them how the work is done . . . train them thoroughly . . . hold special classes if necessary. In order to keep their interest high, offer a weekly prize or bonus to the serviceman who does the best renovation job on an old case.

"Remember, old cases will not sell; old cases that have been reconditioned will sell, and at a handsome profit, too.

"Service has a direct influence on total sales. If used equipment is properly installed and serviced, as needed, then it will be easy for salesmen to sell additional equipment to the same buyer, and to the buyer's friends and competitors.

Good Service Serves As Public Relations Tool

"Service — good service — helps keep the customer happy. Good service is one of the best public relations tools a refrigeration dealer can possess. Every time you short measure one of your customers in service, you are automatically cutting out some of your own future sales.

"Different companies have different policies on arriving at the profit and loss figure on the the service department. Two large firms charge as much as 35% overhead to the operation of their service departments. Several charge as little as 10%, and some don't charge anything at all for overhead.

"I think the best method for arriving at such a figure is to determine first what your investment is in the service department—how much in inventory, how much space used, how many men working.

"Take these figures and compare them with your total overhead figures. Don't forget taxes, interest on notes, fire insurance, truck repairs, and other related expenses.

"After you consider all these facets of service operation, you will be able to arrive at a just and equitable figure to charge against service for overhead.

"Also, don't forget that part of the cost for maintaining executive offices should be charged against service overhead.

"Different companies will naturally reach different conclusions on service overhead. But when you fail to charge your service department with operating overhead costs, you are whistling in the dark when you count your profits.

"Earlier, I said markup on service costs should average from 30 to 35%. In different parts of the nation, this figure would not hold true. Some companies mark up as high as 100% and some keep their markup as low as 25%.

"In service parts that are highly competitive, I think a moderate markup would suffice; in service parts that are not readily available to the general public, I think a high markup should prevail.

Service Manager Needs Proper Guidance

"Markup on labor should be the prevailing price in the locale where your company is located. This, too, will vary from state to state.

"I am firmly convinced that most refrigeration dealers don't know for certain whether or not they are realizing a profit from their service departments.

"If you are not making a profit in your service department, you are mismanaging your business. One common fault among some of us is the fact that we turn all service problems over to our service managers without giving them proper guidance and direction on company policy. This is the wrong thing to do.

"Service managers are not executives — they are policy formulators. If they were, they would not be working in service.

"Don't expect your service manager to put your service department in the green by waving a magic wand. Only you can pull it out of the red. It will take hard work, patience, ingenuity, and thinking. Put your feet up on your desk at least once a day and just think.

"Many companies today are hiring men to just sit and think. Encourage your employes to think. If they come up with a good idea, use it. Give them credit for it. Don't try to hog all the glory for yourself.

"Every man likes to feel that he is capable of doing a few things well, all by himself. Encourage such thoughts. Help others feel important and they will make you important.

Keep Close Contact With Each Employe

"Now is the time to put your service department on a paying basis. Keep a daily record on every man. Talk with your men individually and collectively, at least once a week. Let them know that you are checking on them. Let them know that you are interested in helping them make a greater profit for themselves and for the company. Reward them when they deserve it; censor them if they require it.

"Your company is only as good as the employes you have working for it. Happy employes make a good company; unhappy employes will ruin the best company. Only you can prevent unhappiness in your employes. Only you can make your company successful."

NFC, OHI To Merge; Plan Big Drive

NEW YORK CITY—The National Fueloil Council and The Oil Heat Institute of America, respectively, on Jan. 25 and 26, at board of directors meetings of each organization here, voted unanimous approval of the merger of these organizations into a new national association which will promote fuel oil and oil heating equipment "on a scale never before achieved," the OHI announced.

WALK-INS

Howard manufactures a complete line of commercial refrigerators and freezers. Priced right, provides more daily sales and profits.

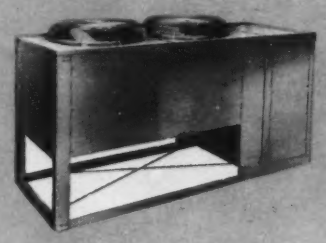
Territories for distributors and manufacturers' agents.

For a free Master Catalog write to Dept. N.

Howard Refrigerator Co., Inc.
4745 Worth St., Philadelphia 24, Pennsylvania

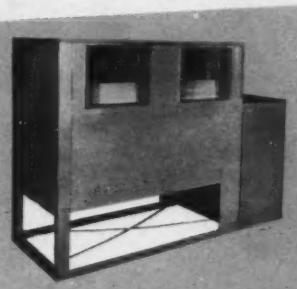
a brand new
PROFIT MAKING LINE
of Commercial air-cooled
split systems FOR YOU!

Air Conditioners
MODELS FROM 7½ TO 20 HP. MULTIPLES FOR HIGHER RATINGS



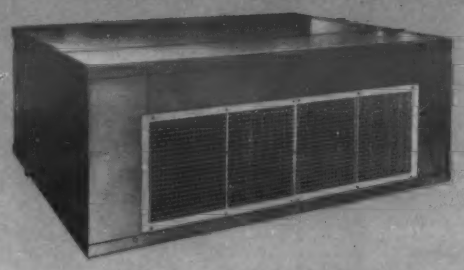
CONDENSING UNIT
Rugged • Quiet • Weatherproofed • Diagonal coil for minimum plan area • Controls wired and enclosed • Compressor section may be detached • Designed for outdoors.

Heat Pumps
MODELS FROM 7½ TO 20 HP. MULTIPLES FOR HIGHER RATINGS



CONDENSING UNIT
High cfm., low sound level, Blower type fans • High capacity coil • Greater flexibility in equipment location • Supplimentary heaters if required.

Horizontal Air Handlers



Sizes to match Condensing Units • For remote installation with ducts or with plenum and 4-way grille as optional extra • Large coil face area for low air velocity and low sound level.

12 YEARS AND OVER A MILLION UNITS

of air conditioning and refrigeration systems have provided the experience behind this Commercial Line. Since 1949 our facilities have expanded each year to where we now have more than 230,000 square feet of manufacturing area. Addison's know how, experience and fully equipped plants are your assurance of quality products.

ADDISON PRODUCTS COMPANY
ADDISON, MICHIGAN · PHONE LINCOLN 7-1200

Survey Finds

Fewer Sheet Metal Distributors Now Handle Imported Materials

PHILADELPHIA — In the latest survey of members of the National Association of Sheet Metal Distributors, 58% of those replying indicate they currently handle no imported materials whatsoever.

The association conducts these surveys periodically and a comparison of the results with the study made 10 months ago reveals that four companies who previously handled imported materials no longer do so.

Of the products surveyed, the largest number of members reported handling foreign nail and wire products, closely followed by sheet aluminum and copper. Of those companies carrying any of these imported materials at all, the average was over 54% of the stock of the item handled, with some carrying as much as 100% of certain imported products.

No reporting member of the association carries any uncoated steel, while only two of the 52 members replying reported carrying any coated steel and then only a small amount.

One member who reported carrying 50% imported copper stated, "Now that the domestic producers have begun to meet the price differential, our domestic purchases are increasing and may be currently at the rate of 90% domestic."

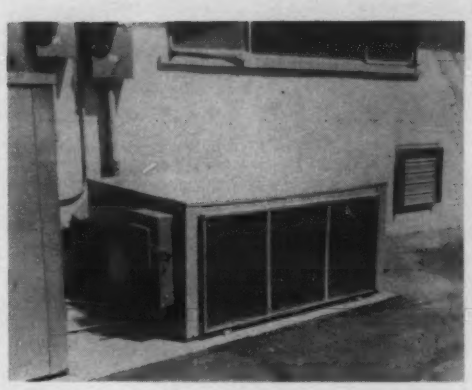
NWAHACA Designs Six Silver Shield Logos

CLEVELAND—Six new logos declaring support for the "Silver Shield" program have been designed and released for use by members of the National Warm Air Heating & Air Conditioning Association.

The six logo insignia are in two colors and contain the message: "We Support The Silver Shield, Tomorrow's Comfort Today!"

Each is different in shape and design and can be printed in black and white or in two colors. And, each contains a different art concept to suit the needs of advertising and sales managers in preparing trade and consumer ads or for use on their individual literature.

"The logos will also be used by gas, electric, and oil firms to indicate their support.



5-TON HEAT-X air-cooled condensing unit powers reservoir of cold system that keeps Jaroch Mortuary cool when needed during Modesto, Calif.'s torrid summers.

Keep Mortuary Cool with 5 Hp Compressor and Reservoir of Cold

MODESTO, Calif. — Consistently high summer temperatures in Modesto coupled with intermittent use of the Gorden O. Jaroch Mortuary here, posed a problem in air conditioning.

I.C. Refrigeration's Bill Infield, keeping in mind the need or low initial cost and low operating cost, met the challenge with a system utilizing Dunham-Bush equipment and a "reservoir of cold" to successfully handle peak requirements of a full chapel on the hottest days, it was reported.

Here's how Infield went about engineering this mortuary air conditioning system:

To meet design demands, he selected a Heat-X RCU 500C air-cooled condensing unit. This unit operates at a suction temperature below 30°.

Next step was to use a collection tank for chilled water, being circulated by an A9 pump to a Dunham-Bush HAH air handling unit and concealed CR room air conditioning units.

Heat exchange plates in the chilled water tank build up ice when the mortuary is not in use and during peak loads the system draws on this "reservoir."

"Further initial cost and operating cost efficiencies are effected through the design of the system, in that a 5-hp compressor suffices rather than one five times this size which would ordinarily be required."

'Freon' Div. Transfers Nesbit to Wilmington

WILMINGTON, Del.—Donald W. Nesbit, Jr., West Coast salesman for Du Pont's "Freon" Products Div., has been transferred to the division's main offices here to handle special projects and studies in the field distribution of refrigerants, the company announced.

Nesbit

Copeland

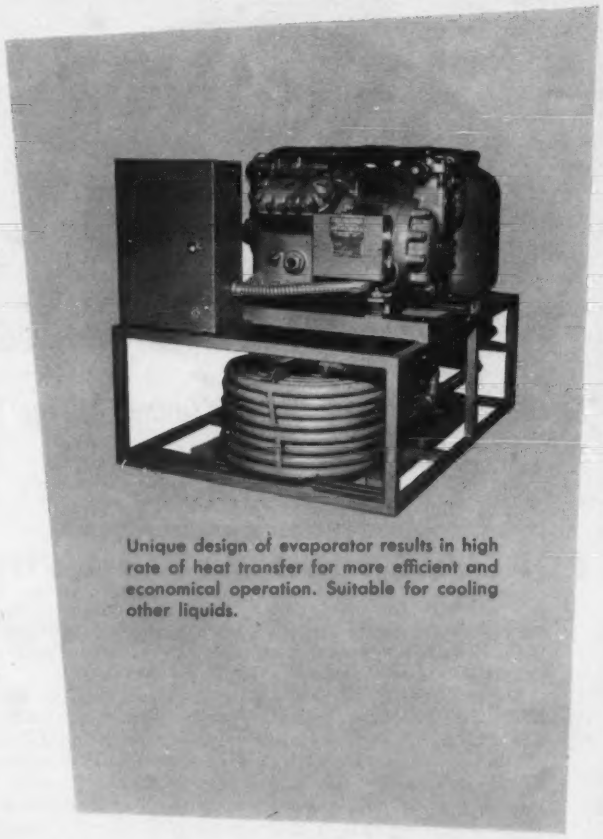
McKenna

The Oregon and Washington territory formerly covered by Nesbit has been taken over by L. D. Copeland, Jr., and the Utah territory by Douglas H. McKenna, Jr.

Copeland has been a sales assistant in the "Freon" Products western district office since December, 1959. McKenna has been with Du Pont since 1954 in "Freon" Products sales.

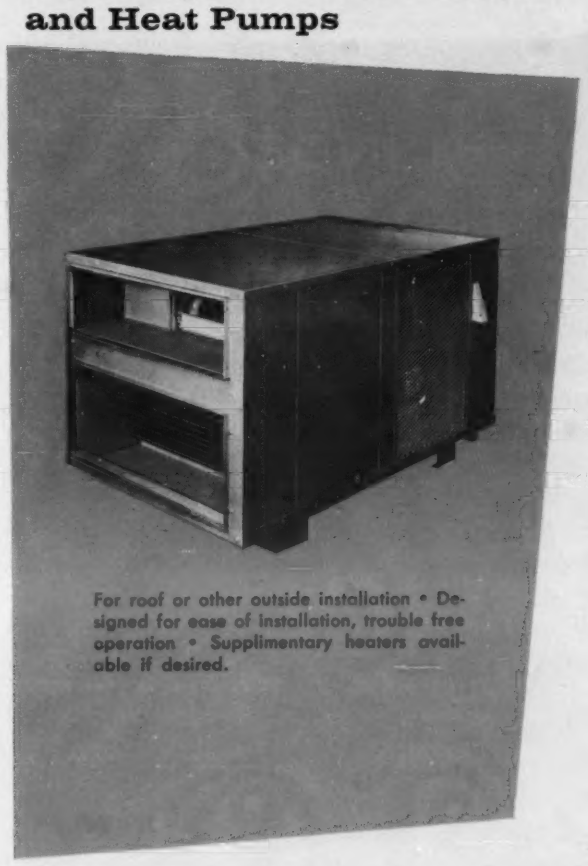
a brand new
PROFIT MAKING LINE
of Commercial Packaged
Units FOR YOU!

Packaged Water Chillers
MODELS FROM 3 TO 15 HP. MULTIPLES FOR HIGHER RATINGS



Unique design of evaporator results in high rate of heat transfer for more efficient and economical operation. Suitable for cooling other liquids.

Commercial, Air Cooled, Roof Top Air Conditioners and Heat Pumps



For roof or other outside installation • Designed for ease of installation, trouble free operation • Supplimentary heaters available if desired.

DESIGNED FOR THE CONTRACTOR

A quality line to fit your profitable middle market between the highly competitive residential units and the big, complex industrial installations. Easy to install • Flexible to meet any conditions—multiples for higher ratings • Quality features to sell customers and keep them sold • Durable, trouble free construction • A price structure that will get business for you, *and at a profit.*

ADDISON PRODUCTS COMPANY
ADDISON, MICHIGAN · PHONE LINCOLN 7-1200

Hermetic Trends & Service Requirements (1)

*By John J. Floreth, Vice President and Director of Services, York Div., Borg-Warner Corp.**

The first reported hermetic compressor dates back to a machine patented in Germany in 1924 using sulphur dioxide as a refrigerant. However, the advent of the commercial hermetic compressor in this country started in 1929 when General Electric introduced the monitor top domestic refrigerator.

Further development during the next 12 years was largely confined to the domestic refrigerator field and then temporarily halted by the World War II years. The next big impetus occurred in 1946 with York's introduction of the first hermetic compressors in ¾ and 1-hp sizes for application in room air conditioners.

The obvious advantages of a completely sealed system in this type of appliance spurred further development of larger sizes and by 1956 many segments of the industry were producing hermetic compressors up to 10 hp. Above 10 hp, in the reciprocating type of compressor, the trend has been to a bolted or semi-hermetic type of machine.

SUMMARIZING the history and impact of hermetic compressors on the air conditioning and refrigeration industry, this series of articles goes on to discuss modern concepts of hermetic servicing.

During the past 15 postwar years the continued development and application of hermetic compressors and condensing units has grown to the point where they practically dominate our industry today. Based on ARI and the Department of Commerce "Facts for Industry" reports we have developed various statistical data and charts that clearly emphasize this trend.

Note in Fig. 1 the industry sales growth from slightly over 2,000,000 units in 1954 to 4,030,000 in 1959. The darkened portion of each year represents the sale of hermetic compressor

(Continued on page 35)

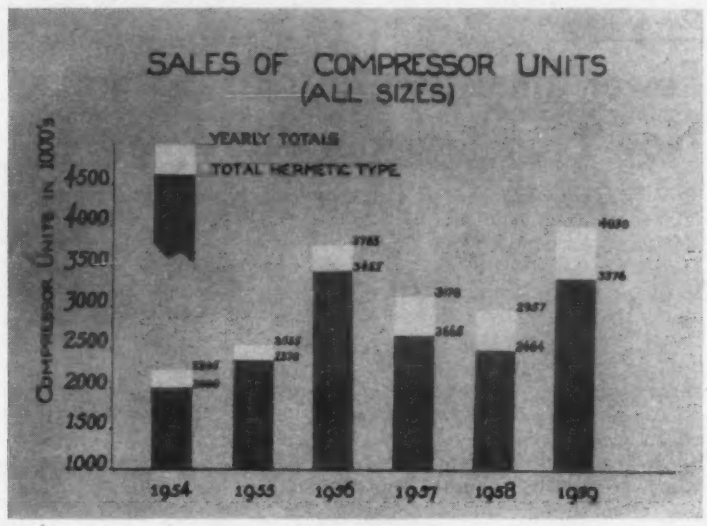


FIGURE 1

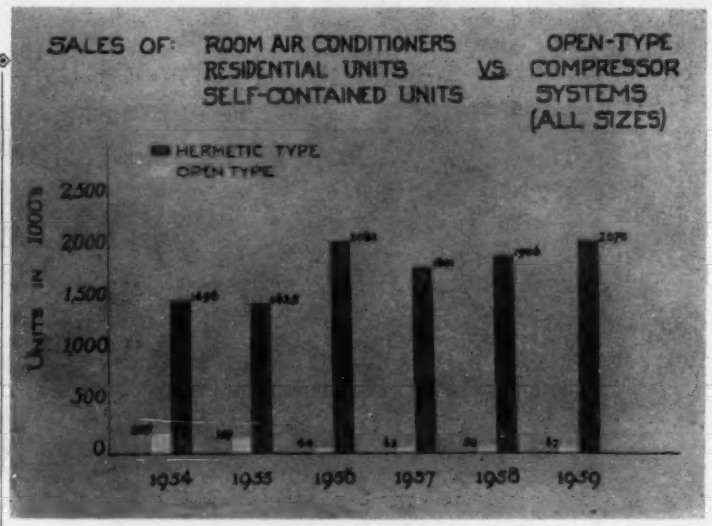


FIGURE 2

TODAY'S HIGHEST CAPACITY DESICCANT

for Super-Drying Refrigerants

—LINDE MOLECULAR SIEVES

Seven years of field experience and research have given LINDE undisputed leadership in adsorption technology—through development of uniform, high capacity, high strength, high bulk density Molecular Sieves—the first synthetic crystalline adsorbents.

LINDE now has available **new hard bead** desiccants . . with greater-than-ever particle strength for refrigeration systems . . specifically designed to eliminate freeze-up and corrosion.

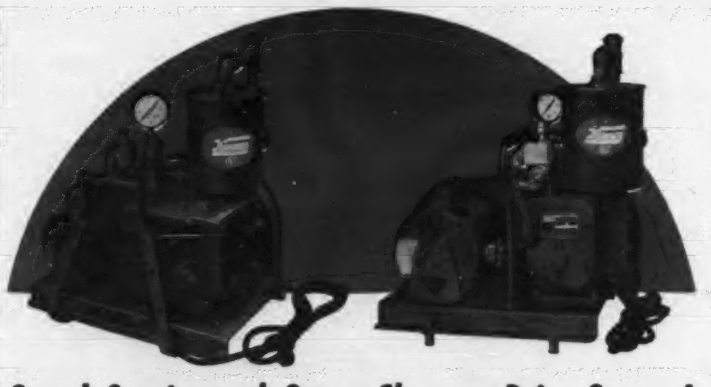
Today, the vast majority of original equipment manufacturers and replacement cartridge suppliers look to LINDE—not only for materials "tailored" to rigid specifications—but for dependable Technical—Service on all problems of static and dynamic desiccation.

For samples of Molecular Sieves and full information on proven applications, write. Dept. AC-02 Linde Company, Division of Union Carbide Corporation, 270 Park Avenue, New York 17, N. Y. **In Canada:** Union Carbide Canada Limited, Linde Gases Division, Toronto 12.

Linde MOLECULAR SIEVES

"The Original Synthetic Zeolite" (Patented)

UNION CARBIDE



Speed Service and Get a Cleaner, Drier System!

Kinney®

PORTABLE HIGH VACUUM PUMPS—

A better job—faster . . . that means completely satisfied customers and more service per man per day. It also means that with modern equipment your service operations turn in the profits you're now losing.

These KINNEY Portable units enable you to LEAK TEST . . . EVACUATE . . . DEHYDRATE Freon Refrigerating and Air Conditioning Systems in the shop or on location. The KC-3R, displacing 3 cfm at 1135 rpm, is especially suited to systems of 10 tons or less. The KC-8R, with free air displacement of 8 cfm at 1000 rpm, is the Pump for systems exceeding 10 tons. Each of these KINNEY Pumps includes: Bourdon type Vacuum Gage, automatic Vacuum breaker in case of power failure, male fitting for connecting to copper tube suction line, 10 ft. plug-in cord and snap switch and carrier handle.

KINNEY VACUUM DIVISION
THE NEW YORK AIR BRAKE COMPANY
3617B WASHINGTON STREET • BOSTON 30 • MASS.

Write for Bulletin No. 4570.1 and price information today!

Please send me Bulletin 4570.1 describing KINNEY Portable High Vacuum Refrigeration Service Pumps.

Name_____

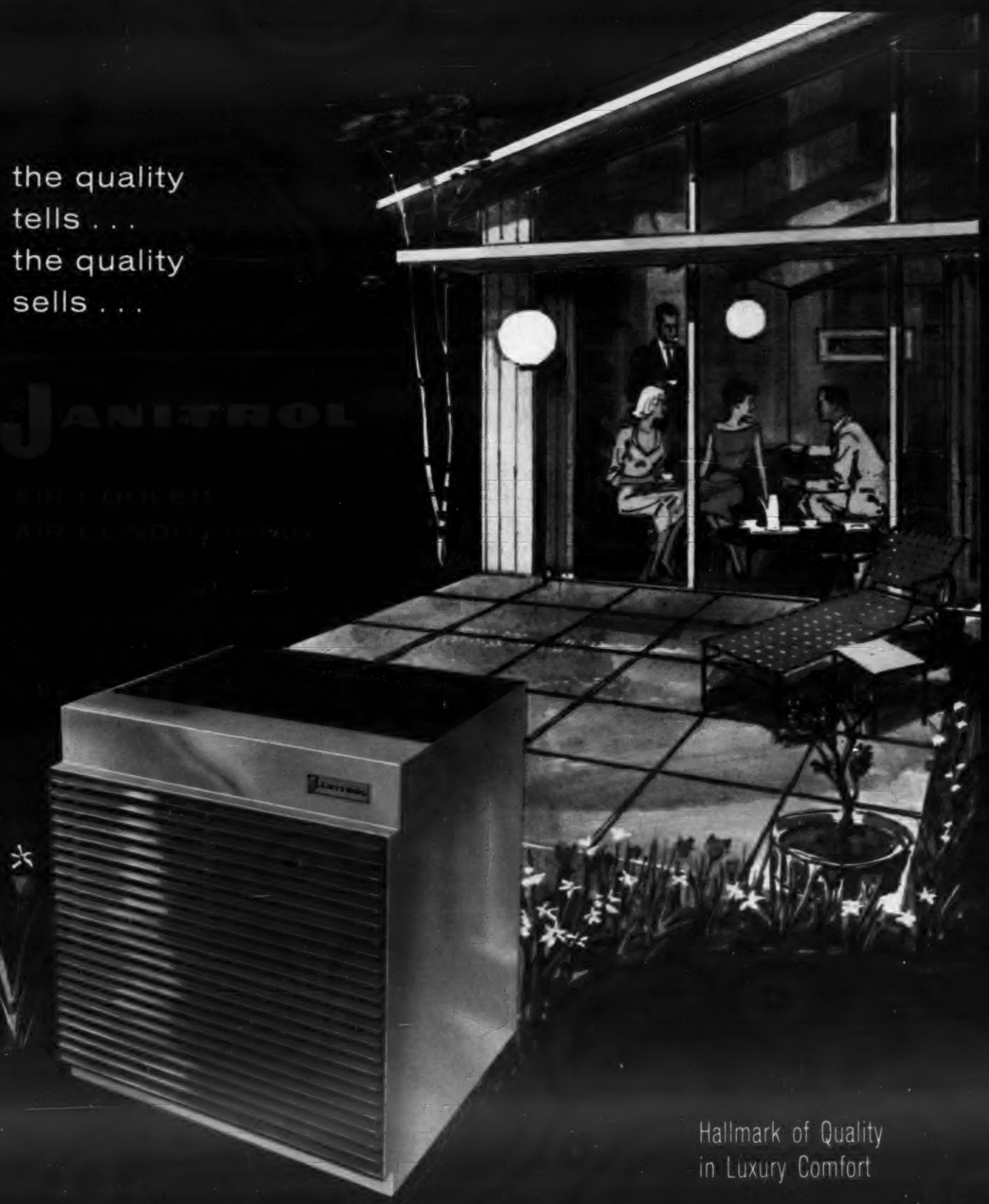
Company_____

Address_____

City_____ Zone____ State_____

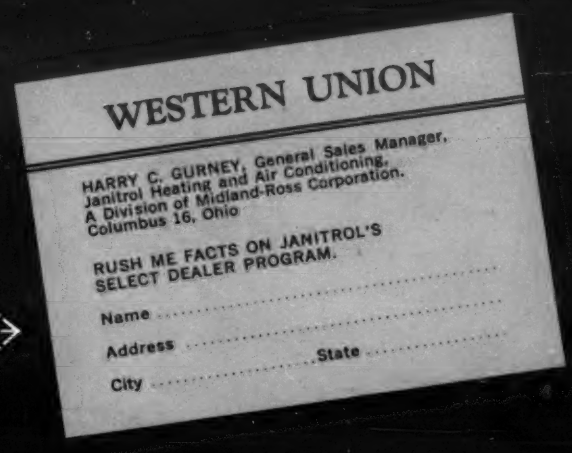
the quality
tells . . .
the quality
sells . . .

JANITROL



Hallmark of Quality
in Luxury Comfort

WIRE US COLLECT FOR PROOF



THE PROFIT PARADE IN THE 60'S WILL BE LED BY **JANITROL SELECT DEALERS!**

Paced by the exclusive *Janitrol Select Dealer Plan* that gives you *action* in place of promises . . . adds vital new depth and dimension to your *Growth and Profit Future!*

check-out the highlights!

1 **The Finest Factory Technical Training Program** in the industry . . . tuition-free for Select Dealers!

2 **Personalized Dealer Management Services** . . . expert guidance in all phases of management, including sales training, recruiting, accounting, advertising, and engineering available to Select Dealers at no cost!

3 **Dealer Information Service** . . . authoritative newsletters, bulletins and periodicals keep Select Dealers up to date on latest developments in equipment, applications, service and merchandising slants!

4 **Regular Regional Meetings** . . . bring Select Dealers and Janitrol personnel together for stimulating discussions of merchandising, management, engineering and other subjects pertinent to dealer growth and profit!

5 **Liberal Dealer Stocking Plans** . . . assure the equipment required by Select Dealers will be on hand when needed.

6 **Free Retail Salesman Training and Aids** . . . Janitrol helps recruit and train salesmen for Select Dealers. Provides proven, sales-clinching presentation manuals for cooling, heating and new home builder selling!

7 **Protected Territories** . . . Select Dealer Franchises in any market area are limited. No "free-wheeling" franchising to choke off profits!

8 **Powerful Planned Co-op Advertising** . . . a year-round program of hard-hitting local level advertising and promotion prepared for you by experts!

9 **Powerful National Advertising** . . . to create demand in your own local market for Janitrol products—back up your sales and promotion activities!

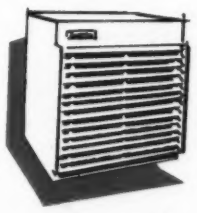
10 **Promotion Package Worth $300.00** . . . for newly franchised Select Dealers. Includes illuminated signs, floor and window displays, colorful literature, demonstration kits, etc.

11 **Yellow Page Telephone Listings** . . . reserved for you, as a Select Dealer, in your own local phone book under the JANITROL headings.

12 **Competitive Pricing** . . . made possible by famous Janitrol advanced engineering and new automated production lines. Puts Select Dealers in the driver's seat with quality at low cost!

13 **The Top Brand Name** . . . Janitrol leadership in design and quality is nationally recognized and acclaimed. Over two million Janitrol units have been sold!

14 **A Great Line . . . A Complete Line** including the all-new 52 Series condensing units!



Now, a cooling line built to bring you new sales and profit opportunities . . . do away with installation and service headaches! The new 52 Series units have larger coils for higher efficiency . . . distinctive, prestige styling . . . sun-shaded coils . . . weather-resistant finish . . . acoustically treated cabinet . . . 100% safety for children and pets. Top exhaust protects nearby plants . . . Full A.R.I. Certification . . . operates with up to 125°F outside temperature!

Other quality products in Janitrol's full line include Oil and Gas-Fired furnaces in horizontal, vertical and counter-flow models . . . plus a special line of competitive equipment built for the high volume, new home market! In cooling, Janitrol covers the residential and commercial markets with economical, self-contained units; add-on, modernization units and a completely new series of air-cooled condensing units. Janitrol Unit heaters, duct furnaces and schoolroom conditioners blanket the industrial heating market with a wide selection of models from 30,000 up to 1,750,000 Btu inputs.

You owe it to yourself to get the full story on Janitrol's full line . . . plus the fabulous Janitrol SELECT DEALER PLAN! WIRE COLLECT RIGHT AWAY!

FOR SOARING PROFITS IN THE SIXTIES, JOIN THE JANITROL SELECT DEALER GROUP! WIRE COLLECT FOR COMPLETE INFORMATION, ABSOLUTELY WITHOUT OBLIGATION...

JANITROL
HEATING AND AIR CONDITIONING
A Division of Midland-Ross Corporation
Columbus 16, Ohio • In Canada: Moffats Ltd., Toronto 15

Floreth on Hermetics--

(Continued from page 32)

units of the completely sealed type below 20 hp in size. It reveals that the industry reported sales of approximately 3,400,000 hermetic units in 1959 representing almost 84% of the total unit sales.

Today in our industry, room air conditioning units, residential units and self-contained commercial air conditioners represent over half of the total number of compressors applied each year, and are almost entirely of the hermetic type.

Fig. 2 contrasts the sale of these units with the number of open type reciprocating compressor units during the same years of 1954 through 1959.

While the sale of air conditioning units using hermetic type compressors has gradually climbed from 1,500,000 to 2,070,000 during the past six years, the total sale of open type compressor units, omitting the automotive air conditioning compressors, is almost insignificant by comparison and has declined to an average level of approximately 50,000 units per year.

Fig. 3 shows the comparison of manufacturers' shipments of condensing units below 20-hp size, where a comparison of open and hermetic types would appear to be more accurately determined.

Here again, we see that hermetic units have gradually increased from 497,000 in 1954 to approximately 613,000 in 1959 while the open type have declined from 72,000 to 23,000 during the same period. It is also interesting to note that the hermetics have increased from 87% of the total industry shipments in 1954 to approximately 96% in 1959.

During the past six years there has also been a strong growth trend of hermetic type centrifugal compressors which are now available in water cooling systems and many other special applications in sizes ranging from approximately 75 hp to over 1,500 hp.

The many advantages of a completely sealed, factory assembled and tested system that can be readily installed in the field with minimum labor and expense have given tremendous impetus to our industry's research and development programs in this area.

Industry statistical data distinguishing between hermetic and open type centrifugal compressor sales was not available prior to 1958. However, it is significant to note that even in this phase of our industry there were over 1,300 centrifugal units shipped in 1959, representing an approximate volume of $36,000,000 at the manufacturer's level, and that 80% of these units, representing 70% of the dollar volume, were of the hermetic type.

During the past 15 years the application of hermetic compressors has spread to cover almost the complete range of installations served by the refrigeration and air conditioning industry.

Beyond the many types of units designed to serve the residential and commercial mass markets with which we are all familiar, there is a definite trend toward using hermetics in innumerable remote applications including large central station air conditioning systems; specially designed and field assembled low temperature refrigeration systems; special low temperature cabinet applications, truck refrigeration units, refrigerated railroad car systems, packaged ice makers, vending machines, and a long list of other applications that demand our attention.

We can safely predict that the hermetic compressor and system are here to stay, and rapidly increasing in popularity each year.

I personally believe that the next ten years will see the complete obsolescence of the open-type compressor and system for new installations.

(To Be Continued)

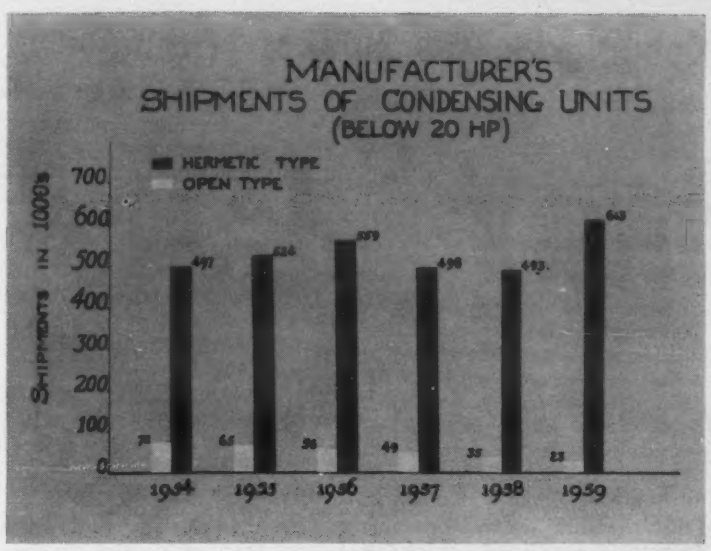


FIGURE 3

THE THREE BAR CHARTS in this first portion of Floreth's series give a visual presentation of the impact which hermetic compressors have made on the refrigeration and air conditioning industry.

Mueller Climatrol Announces Appointments

MILWAUKEE — A series of promotions at Mueller Climatrol Div. of Worthington Corp. has been announced by H. P. Mueller, Jr., division president.

William M. Krupp has been promoted to controller.

R. W. Weekes has been appointed manager of marketing services. Prior to the consolidation of Mueller Climatrol, Alhambra, Weekes had been general manager of the Alhambra, Calif. operation.

William Thompson becomes plant manager for the Alhambra operation. He was formerly Alhambra's production manager.

James O. Fichtner has been appointed chief engineer-heating, and N. Ed. Hill has been appointed chief engineer-hydronics.

COMPLETE

C-O-M-P-L-E-T-E—that's the word that best describes Wolverine Tube's finned tube product line and customer services.

For example, illustrated here are seven different types of Wolverine Trufin®—the integrally finned tube. Included are both low-finned and high-finned types for such applications as shell and tube units, water heaters and boilers and air cooled heat transfer requirements.

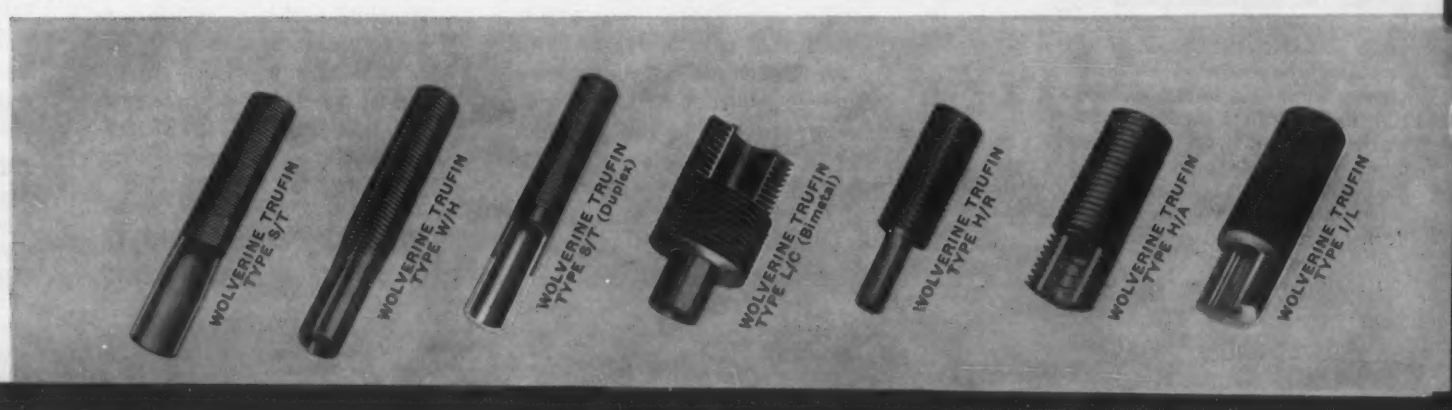
Wolverine Tube has manufactured integrally finned tube much longer than any other company in the industry; thus, Wolverine customers have a reliable and readily available source for finned tube literature, information and technical heat transfer consultation and guidance.

So, to *completely* consider finned tube, its comparative values, performance ratios and to find the finned tube best suited to your needs, turn to Wolverine. For complete information write, wire, call or . . . Ask Your Wolverine Tube Salesman . . . He Knows!

NEED HEAT TRANSFER HELP? Wolverine Tube's Field Engineering Service—a staff of competent, highly trained tubing technicians—is ready at all times to help you solve heat transfer problems concerning tubing. All you have to do is ask—there is no obligation.

WOLVERINE TUBE
DIVISION OF
Calumet & Hecla, Inc.
DEPT. J, 17246 SOUTHFIELD RD., ALLEN PARK, MICH.
Manufacturers of Quality Controlled Tubing

PLANTS IN DETROIT, MICHIGAN AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES


WOLVERINE TRUFIN TYPE S/T
WOLVERINE TRUFIN TYPE W/H
WOLVERINE TRUFIN TYPE S/T (Duplex)
WOLVERINE TRUFIN TYPE L/C (Bimetal)
WOLVERINE TRUFIN TYPE H/R
WOLVERINE TRUFIN TYPE H/A
WOLVERINE TRUFIN TYPE I/L

'60 Residential Air Conditioning Off 20% In Wichita--

(Continued from Page 1)

est employer. The other, as a result of the layoffs, was an oversupply of built but not sold new homes that put a serious crimp in builders' plans.

The figures in the table accompanying this article, however, given by the contractors themselves, indicate that, while heavy layoffs may have had repercussions in the new home field, they actually affected air conditioning sales to existing homes more.

Yet contractors, in their comments to the NEWS, were more conscious of builder retrenchment than of homeowner withdrawal.

6 Sold More Home Cooling Than In '59

Again, while most of the 15 contractors interviewed shook their heads when asked about home cooling sales, six of them (40%) sold more home air conditioners in 1960 than in 1959, which was considered a good year.

As of mid-November, the 15 contractors interviewed, had sold 823 residential cooling systems in 1960. This compared with 1,019 by an equal number of, thought not the same, contractors in 1959.

Two of the contractors responding in 1959 did not respond in 1960 though both continued active in the market. A third went out of business. However, the top five contractors in 1959 were the same top five contractors in 1960, though the order changed markedly.

Two of the contractors responding in 1960 but not in 1959, were old line contractors who had participated in previous NEWS surveys. The third was a newcomer, entering the field with a gas air conditioner in September. He, apparently, met with good response.

387 Units Sold to Builders

Of the 823 residential systems sold last year, 387 of them were sold to builders as compared with 382 in 1959. However, the two contractors who dominate the builder market got even a larger share than in 1959, contributing, no doubt, to the feeling among the other contractors that this market had about dried up.

Buyers of new homes bought 32 air conditioning systems during 1960, off slightly from the 36 purchased in 1959. Six contractors shared in this business —the same number as in 1959.

A total of 403 systems were sold to owners of existing homes, down sharply from the 601 reported for 1959. All but one contractor participated in this business and three sold more units than in 1959.

Only 2 Sold Heat Pumps

Only two contractors sold any heat pumps. One installed three units and the other one.

All of the contractors interviewed were also in the residential heating field and all sold warm air units. Of the 1,540 home heating systems reported sold last year, all but three were warm air jobs. Two were hydronic systems and one an electric heat system.

Heating sales for 1960 were also sharply down from 1959, even more so than air conditioning. The 15 contractors reporting in 1959 sold 2,566 residential heating systems.

12 Sold Commercial Air Conditioning

Twelve of the contractors sold commercial air conditioning equipment, installing 210 units as compared with 230 in 1959. Not a single commercial heat pump was sold. Eleven contractors sold 255 commercial heating systems as compared with 175 in 1959.

Of the nine contractors able to break down the percentage of their dollar volume that could be attributed to these product categories, only one did more than half of his business in residential air conditioning. Only three did more than 25% of their business in that field.

Six of the nine contractors did more than half of their business in commercial and residential air conditioning. Only one other did more than 25% of his dollar volume in air conditioning.

Twelve of the 15 contractors said they stocked at least some of their equipment in advance of sale. Only three—the bottom three on the chart—did not stock in advance of sale.

Some Contractors Buy from Manufacturer

Nine contractors said they bought their residential air conditioning and heating equipment direct from the manufacturer. Six bought it from a distributor and two from an independent wholesaler. Two of the nine purchasing direct from the manufacturer also bought some of their equipment through a franchised distributor.

Of the 12 contractors selling commercial air conditioning equipment, nine bought direct from a manufacturer, four purchased through a franchised distributor, and one through an independent wholesaler. Again, two who purchased direct, also bought some of their stock through a franchised distributor.

Of the 11 contractors selling commercial heating equipment, nine bought direct from the manufacturer, four bought through a franchised distributor, and two through an independent wholesaler.

20 Brands Sold

Ten of the 15 contractors dealt directly with a manufacturer for at least some of their equipment and six dealt only with the manufacturer.

Twenty brands of residential air conditioning equipment were sold by these contractors in 1960 as compared with 15 brands in 1959.

To promote air conditioning sales, telephone book advertising and newspaper advertising were each employed by 10 contractors. Five used radio and five TV advertising. Only two mentioned direct mail, while one each tried a telephone survey, home show display, gas light, sign board, and a builders' magazine.

Most productive source of sales was personal contact, cited by 12 contractors. Eleven mentioned referrals, six bids, and five leads from advertising. Other sources such as Dodge reports, canvassing, store traffic, and leads from manufacturer or supplier receiver a few scattered mentions.

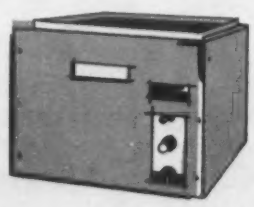
One contractor who shared the general belief that the builder market for air conditioning had sharply contracted,

GM Delco

ANNOUNCES

A NEW AIR CONDITIONING LINE

CENTRAL RESIDENTIAL COOLING UNITS FOR EVERY TYPE AND SIZE OF HOME, NEW OR OLD! THE ENTIRE MARKET IS YOURS WITH THE GM-DELCO LINE!



COOLING COIL (EVAPORATOR) UNIT
Now there's a Delco-engineered air conditioning unit to fit any Delco furnace. Installation is quick and simple. Also, you can convert your customer's present forced air furnace to central air conditioning with just the right GM-Delco unit to make it easy, practical and profitable!

REMOTE CONDENSER UNIT
The GM-DELCO line includes attractive, weatherproof condensing units in sizes to meet a wide range of needs. Durably built for outdoor installation and designed for the most efficient operation. Ratings from 22,000 to 56,000 BTU/HR. Maximum over-all dimensions—Height 28¾", Width 48⅝", Length 31⅛".

SELF-CONTAINED SYSTEMS
The GM-DELCO line offers you completely self-contained cooling units. Shown is a type for use with hot water, steam or other heating systems without duct work. Easily installed in attic or crawl space with inexpensive duct work.

THE GM-DELCO HEAT PUMP
The GM-DELCO Heat Pump (not shown) is available as a self-contained or split system and provides both heating and cooling as required.

A COMPLETE LINE OF AIR CONDITIONING, HEAT PUMPS, FURNACES, BOILERS AND WATER HEATERS TO MEET ALL YOUR REQUIREMENTS.

Wichita Air Conditioning Sales by Contractor

No.	RESIDENTIAL: 1960 Total	Cooling: New Homes–Bldr.	Cooling: New Homes–Buyer	Cooling: Exist.	Cooling: Heat Pump	Heating: Warm Air	Heating: Hyd.	Heating: Elec.	COMMERCIAL: Cool.	COMMERCIAL: Heat Pump	COMMERCIAL: Htg.	Percentage of Dollar Volume: Residential–Cool.	Residential–Htg.	Commercial–Cool.	Commercial–Htg.	Other
1.	250†	200	20	30	..	300	..	..	10	..	10	20%	7.5	3%	2%	67.5
2.	118†	15	3	100	..	181	..	..	..	..	..	80%	20%	....	....	....
3.	118*	26	4	88	3	142	..	..	79	..	98	38%	20%	25%	14%	3%
4.	100*	100	..	..	..	350	..	..	12	..	..	37.5	37.5	25%	....	....
5.	49*	3	..	46	1	31	..	1	28	..	28	NA	NA	NA	NA	NA
6.	40†	18	..	22	..	15	..	..	18	..	16	15%	5%	40%	15%	25%
7.	32*	2	..	30	..	83	..	..	11	..	14	—75%—		—25%—		....
8.	30†	2	..	28	..	40	..	..	3	..	3	NA	NA	NA	NA	NA
9.	21†	11	..	10	..	21	..	..	..	..	..	‡	NA	NA	NA	NA
10.	20*	..	1	19	..	10	..	..	34	..	15	—25%—		—70%—		5%
11.	12*	..	3	8	..	8	..	..	3	..	..	NA	NA	NA	NA	NA
12.	10*	5	..	5	..	300	..	..	1	..	3	10%	10%	5%	5%	70%
13.	10†	5	..	5	..	10	2	..	2	..	50	NA	NA	NA	NA	NA
14.	8*	..	..	8	..	22	..	..	10	..	14	20%	40%	30%	10%	....
15.	5†	..	1	4	..	24	..	..	..	..	4	NA	NA	NA	NA	NA
Total	823	387	32	403	4	1537	2	1	210	..	255	....	....	....	....	....

†Up from 1959. *Down from 1959. ‡Less than 1%.

GM Delco

ANNOUNCES
A GREAT NEW FRANCHISE
THE GM-DELCO KEY DEALER PLAN

- **GENERAL MOTORS' NAME**—assures top flight engineering and a universally known reputation for Reliability.
- **DIRECT FACTORY-DEALER DISTRIBUTION**—planned sales, advertising, training and promotional aids.
- **LIMITED NUMBER OF DEALERS**—in each market, and only they can buy Delco equipment.
- **PROTECTED PRICING**—stable pricing with protection.
- **DEALER LISTINGS IN NATIONAL ADS**—insures your direct participation in dynamic advertising, at no cost.
- **COMPLETE SALES BUILDING PLAN**—with local advertising, prospecting, and selling plans to build your sales.
- **OVER 200 MODELS—PLUS ACCESSORIES**—GM-Delco gives you a model to meet your every need.
- **GENERAL MOTORS GROUP INSURANCE**—available to eligible dealers and their personnel.

GET THE FULL STORY RIGHT AWAY! WRITE TO DELCO APPLIANCE DIVISION, GENERAL MOTORS CORPORATION, ROCHESTER 1, NEW YORK.

GM Delco 365 CONDITIONAIR

opined that this may be a blessing in disguise.

Such business has always been a low profit business, he reasoned, and the loss of it improved the profit ratio of his business, even though volume was down.

Another contractor who also was turning away from the builder market to greener fields in the existing home market indicated that he was picking up some replacement work in homes that had been previously air conditioned.

He found that he can improve on installations put in several years ago to the best of the installer's knowledge and equipment available at the time. More refined equipment and more experience in installation practices is now available and can be sold when the older equipment begins to cause trouble, he indicated.

Dalton Heads Sales Of 'Atmos-Pak' Line

OSSINING, N. Y.—The appointment of Peter J. Dalton as vice president in charge of sales has been announced by George A. Belsky, executive vice president of Air Conditioning Inc., here, maker of "Atmos-Pak" roof-mounted cooling and/or heating equipment.

P. J. Dalton

Dalton was formerly associated with Welbilt Air Conditioning & Heating Corp. in a similar capacity.

In making the announcement, Belsky pointed out that Atmos-Pak "is embarking on an ambitious expansion of engineering, production, and marketing programs."

Management Lineup Is Set at Drayer-Hanson

LOS ANGELES—Key executive appointments at the Drayer-Hanson Div. of Hi-Press Air Conditioning of America, under recently-announced merger of the two firms, have been made known by Seymour W. Brown, president of Hi-Press.

Brown said the Drayer-Hanson Div. will function under a management council to consist of J. H. Anderson, J. F. Lewis, and I. B. Secord.

In addition, Anderson will serve as D-H production manager; Lewis as chief accountant; and Secord as national sales manager, Brown indicated.

Other leaders are J. Frank Chambers, western sales manager; C. A. Hastenstab, purchasing agent; R. Dale Zechar, director of industrial and public relations; Robert C. Boose, factory superintendent; Sam E. Nelson, industrial sales manager; William G. Keichline, chief engineer; and Albert J. Mallinckrodt, consulting engineer.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Are Engineers Joining Unions?

"Engineers Are Joining Unions" was the title of the NEWS' Jan. 9 editorial. The editorial summarized the changing status of the growing number of professionals in American industry and suggested that there is a trend toward the formation of collective bargaining groups by engineers and scientists. Here are some reactions to that suggestion.

Industrial Union Dept.
AFL-CIO

Editor:

Portions of my report presented before the Industrial Relations Research Association, in December, are pertinent to your editorial:

The very nature of modern industrial society is making the engineer and the scientist in industry, as well as the research specialist in the laboratory, a kind of new technological elite.

I am convinced that sooner or later organizations—unions in one form or another — will emerge among these groups as well as for the more routine groups of white collar workers. When, for example, some firms come to employ 2-3-4,000 engineers and technicians, the old notion of professional individuality is bound to give way to the needs for group representation.

I think successful engineering unionism in the U.S. will, ultimately, be closely related to production and maintenance unionism in the great industries.

Whether this will take the form of complete integration of professional and high level technical workers (I am thinking of college graduates primarily) into the ranks of large industrial unions, I am not quite certain. Even should this be the route, however, there will doubtless be need of institutions which can establish occupational bonds of an inter-industry character among these groups of workers who have such a strong desire for purely professional association.

Successful engineering or professional unionism will probably spawn some new functions for unionism. Clearly, experience to date among engineers suggests that traditional union emphasis on such things as seniority for promotions and layoffs will undergo some modifications. . . . There seems to be an especially strong interest among engineers in welfare items such as pensions and health insurance.

The conservative political tendencies of engineers could pose some special problems for "traditional" political programs of American unionism. On the other hand, this is not to say that engineers will be less interested in political action than the typical union member is today. Ineed, political involvement seems to score much more highly among professional workers than among skilled or unskilled workers.

It is impossible to foresee what forms white collar and professional unionism will take, but I remain convinced that the very nature of modern society will compel white collar workers, like other groups, to seek and develop means and methods of representation in the critical industrial decisions affecting their lives.

EVERETT M. KASSALOW,
Research Director

NSPE Says 'No'

National Society of
Professional Engineers
Washington, D. C.

Editor:

As a general comment, the tone of the editorial is that unionization is making heavy and rapid inroads among engineers and that it is a growing movement. Quite the opposite is the true situation. Not a single major union for engineers has been organized or certified in the last ten years. During the same period, a number of significant union situations have changed in terms of the engineers involved abandoning their former union representation. The most noteworthy cases along this line are Minneapolis-Honeywell, Western Electric, and most recently Sperry Gyroscope Co.

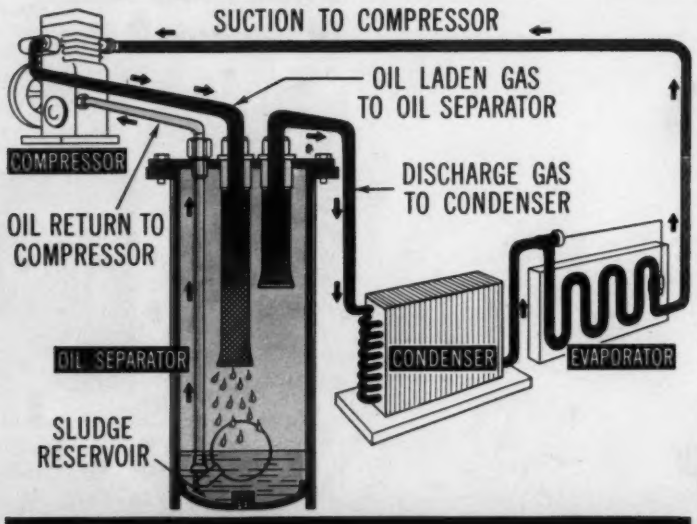
The engineering unions themselves agree with this general observation as indicated by their recent statements describing their outlook as "grim" and similar expressions as shown in more detail in our story in the December issue of the *American Engineer*, a copy of which is enclosed.

You will be interested to know also that the Engineers and Scientists of America (ESA) is now out of business as of this month as a direct result of the series of votes in which engineers in major units terminated union representation, combined with the complete failure of ESA to organize any new units.

With regard to statistical data on engineering unions, I enclose a copy of our "Tabulation of Unions Representing Unions and Technical Employees," marked with the latest changes, which shows that approximately 35,000 engineers classified as professional employees under the Taft-Hartley definition are now represented by unions. The membership of professional engineers in these units is considerably less than the number represented. The most outstanding example of this lack of support is in the case of the Seattle Professional Engineering Employees Assoc., representing engineers at Boeing Airplane Co., Seattle, Wash., in which only approximately 2,500 engineers are members in a unit representing close to 9,000 engineers.

You will note from our figures that this discrepancy between membership and representation exists in almost every unit to a substantial degree. It is very important in evaluating the engineering union situation to keep in mind the fact that in many unions those represented are referred to as engineers, whereas, in fact, they are often technicians or sub-professional people. The American Federation of Technical Engineers, for example, according to the best information we can obtain, has an exceedingly small percentage of those it represents who can truly be considered engineers, and yet the total number

(Continued on Page 41)



Keep oil where it belongs...with a

TEMPRITE

OIL SEPARATOR

1. It is absolutely essential to completely lubricate all moving parts of the refrigeration compressor. Why risk the possibility of a burned out compressor due to loss of oil?

2. Constant clean oil lengthens compressor life. The oil return valve in a Temprite Oil Separator is located above the sludge reservoir . . . allowing the automatic return of clean oil to the compressor.

3. A sludge reservoir is provided in all Temprite Oil Separators to trap carbon, sludge and foreign substances, preventing their continued flow through the refrigerating system.

4. Keeping excess oil out of the condenser, liquid receiver, expansion valve and evaporator will increase refrigeration efficiency.

Temprite Oil Separator muffles sound.
Capacities from ½ h.p. to 225 h.p.

ASME

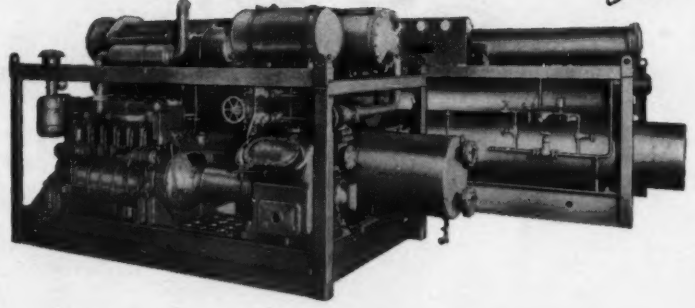
Ask your refrigeration wholesaler or mail us coupon below.

TEMPRITE
The Quality Line

TEMPRITE PRODUCTS CORPORATION
BOX 72-A, East Maple Rd., Birmingham, Michigan
Send me Oil Separator brochure No. T-447
Name_____
Address_____
City_____ Zone____ State_____

Holiday on Ice skates through Africa on Vilter Ice

Holiday on Ice shows, using portable Vilter refrigeration units for building ice surfaces, have been presented in Europe, Middle East, India, Far East, South Africa since 1952.



View showing the two Vilter Ammonia Brine Uni-Chillers shipped in 1960 to Mombasa, Kenya, for Holiday on Ice, Inc.'s latest African tour under State Department sponsorship. The itinerary for the African Show will include Mombasa; Entebbe, Uganda; Dar es Salaam, Tanganyika; and Nairobi.

Last April in Khartoum, Sudan, in 120° temperature, Vilter provided refrigeration for the ice surface of another successful Holiday on Ice Show under State Department auspices.

Since 1952, Holiday on Ice Shows, Inc.'s foreign show units have been using a portable Vilter refrigeration unit for building ice surfaces. In the fall of 1959, this Vilter unit was returned to the United States for rebuilding. According to Mr. A. R. Grant, Business Manager, Holiday on Ice, "We were very much impressed at that time to find that the Vilter equipment required very little work to put it back in top operating condition. It was this experience which led us to select Vilter equipment again for the new 1960 African tour, where we expect to encounter rather extreme conditions."

Two new Vilter refrigeration units were shipped in 1960 to Mombasa, Kenya.

Each Vilter unit consists of a self-contained, fully automatic Ammonia Brine Uni-Chiller, including a 4-cylinder VMC compressor, 16″ x 10′ condenser, a 20″ x 12′ chiller, and a Diesel engine.

Each unit is capable of producing 30 tons of refrigeration and together will develop an ice surface of approximately 60′ x 100′ under any condition.

Vilter equipment has again proven itself as it has in thousands of other installations. Quality design and workmanship pay off in long years of reliable operation—good value for your investment dollar.

Why not see Vilter about your refrigeration or air conditioning application?

Complete ice rink installation engineered by Peter Carver Associates, New York.

Vilter® refrigeration air conditioning

The Vilter Manufacturing Company
Milwaukee 7, Wisconsin
Air Units • Ammonia and Freon Compressors • Booster Compressors Baudelot Coolers • Water and Brine Coolers • Blast Freezers Evaporative and Shell and Tube Condensers • Pipe Coils Valves and Fittings • Pakice and Polarflake Ice machines.

Write for Bulletins on above equipment to The Vilter Manufacturing Company, Dept. RN-600 2217 South First Street Milwaukee 7, Wisconsin

VIRGINIA Chemicals®

REFRIGERATION BULLETIN

"Helpful facts for the serviceman"

ANSWERS TO COMMON WATER TREATMENT PROBLEMS

Water obtained from natural sources is not really pure. It contains foreign matter in varying forms and amounts. This may be present as suspended solids or solids and gases in solution. The conventional dividing line between soft and hard water is 200 ppm (parts per million) of these impurities—the higher the ppm, the harder the water.

It is these substances that cause scale buildup. In cooling with water, evaporation takes place, causing increasingly higher concentration of the impurities. Eventually the solid matter drops out as a sludge or deposits on the metal surfaces, forming scale.

How to identify problem scales

Prepare a dilute solution of solid or liquid scale remover in a glass jar or bottle (1 tsp. of solid scale remover per ½ pt.—1 tbsp. per ½ pt. of liquid). Chip small pieces of scale from the unit, drop them in the solution and observe the action.

Magnesium or Calcium Carbonate Scale
Usually of light color. Will bubble vigorously in the solution.

Iron Scale
Usually a brown or reddish color. Bubbles slightly or not at all. Turns solution to a yellowish color.

Oily Scale
Can be any color. Little visible action in solution, but an oily ring may appear on solution surface.

Sulfate and Silica Scale
Can be any color. Usually are extra hard and flinty. Little or no bubbling in solution. Scale of high silica content may have a glossy surface.

HOW TO REMOVE THEM

Magnesium or Calcium Carbonate Scale
Can be easily removed with either liquid or solid scale remover.

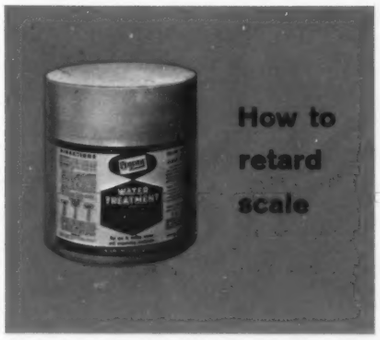
Iron Scale
Requires liquid scale remover. Use 4 gal. per 15 gal. of sump water. Stop fan to let water temperature rise to 100-110°F but not over 120°F. Clean at this temperature for best results. About 4 hr. needed.

Oily Scale
First add 1 box of Dash detergent per 100 gal. of system water. Run 15-20 min. Be sure foaming is not excessive. Leave the Dash in the solution and add recommended dosage of solid (5 lb. per 10 gal. of water) or liquid (1 gal. per 15 gal. of water) scale remover.

Sulfate Scale
Add 1 lb. of baking soda per gallon of sump water. Circulate for 8-12 hr. Then drain, rinse and refill system. Add liquid scale remover—4 gal. per 15 gal. of water. Circulate 2-4 hr., using test papers regularly to check cleaning strength.

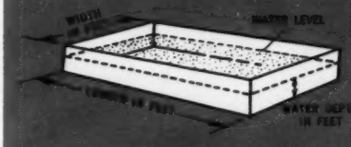
NOTE: *If any of these treatments fails, a second attempt should be made. A second failure would indicate the scale can be removed only by harsh chemical treatment or mechanical means.*

• • •



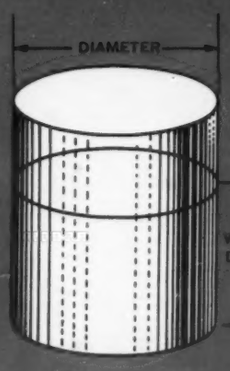
"Virginia" Scale & Corrosion Inhibitor. Glassy polyphosphate crystals provide slow, controlled solubility. No mechanical feeding devices are needed. Inhibitor holds scale-forming solids in suspension or solution. Deposits thin protective film on metal to stop oxidation. Has neutralizing effect on weak acids.

HOW TO CALCULATE AMOUNT OF WATER IN A SYSTEM



RECTANGULAR TANK OR SUMP
Measure (in feet) the length, width and water depth. Then length x width x water depth x 7.5 equals gallons of water.

EXAMPLE: If sump is 5 ft. long, 4 ft. wide, and water is .5 ft. deep, the calculation is as follows:
5 x 4 x .5 x 7.5 = 75 gal.



ROUND TANK
Measure diameter of tank and depth of water in feet. Then diameter squared x water depth x 6 equals gallons of water.

EXAMPLE: Tank has diameter of 3 ft. and water is 3 ft. deep.
9 x 3 x 6 = 162 gal.

See back page for full line of refrigeration products ▶

FOR TROUBLE-FREE MAINTENANCE USE "VIRGINIA" REFRIGERATION PRODUCTS

"Virginia" Scale & Corrosion Inhibitor

Reduces scale buildup sharply, keeping scale-forming solids in suspension or solution. Less scale, less labor, lower maintenance costs.

"Virginia" Liquid Scale Remover

Ideal for heavy scale. Dissolves 3 lb. of scale per gal. Works fast. Inhibited to prevent metal damage. (Anti-foam agent and test papers included with every container.) Light shatterproof throwaway container for easy handling and easy pouring.

"Virginia" Solid Scale Remover

Highly inhibited—safe for use on galvanized, dipped zinc and aluminum water-cooled equipment. Destroys algal growth. Contains 96% sulfamic acid.

"Virginia" Algae-Cides

Adaptable to the special use requirements in (1) towers, (2) evaps, (3) air washers, and (4) ice machines and drip pans. A new No. 4 high-potency formula kills the tough resistant types of algae.

Du Pont FREON* Refrigerants

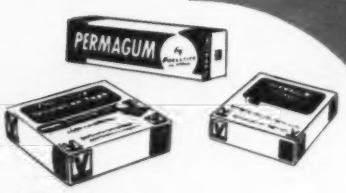
Nonflammable, nontoxic, stable, odorless

Best known for premium quality. Most widely used refrigerants in the industry. "Virginia" is the only national sales agent for Du Pont "Freon". F-11,* F-12,* F-13,* F-22,* F-113* and F-114* are available in cylinders of all popular sizes.

**Du Pont registered trade mark*

"Virginia" Ice Machine Cleaner

Eliminates slow freezing, bad taste and odor. Will not injure enamel or polished metal surfaces. Highly effective on automatic cube or flake ice machines.



Presstite Insulation

Tape—ideal for stopping pipe drip. Adheres to any dry surface. *Permagum slugs*—seals seams, copper tube, BX and conduit entries against moisture. *Cords*—nonstaining, odorless, shaped for use on display cases, freezers, room coolers, etc.

VascoCel Insulation

Preformed of soft, durable, clean, odorless Neoprene. Cuts time and labor costs sharply. Closed-cell structure makes condensation impossible. Ozone, oil, acid, and fungus resistant. Application temperature range 0-220°F. Available in ⅜", ½" and ¾" wall thickness.

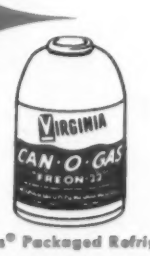
"Virginia" Degreasing Solvent

No. 10 has low toxicity, is noncorrosive and fast drying. High flashpoint of 154-160°F reduces fire hazard; dielectric strength 20,000 volts.

Ask about "Virginia" "Freon 11" Cleaning Solvent for motor burnouts.

"Suniso" Refrigeration Oils

G Oils are improved for greater stability and lower waxing point. Available in 3G-150 SSU, 4G-300 SSU, and 5G-500 SSU. Dual Inhibited oils have same low wax point, resist breakdown and copper-plating even more effectively.



Can-O-Gas® Packaged Refrigerants

Throwaway cans—full line in screw-top or clip-top cans. Wide variety of preweighed charges, accurate to ±4 grams. Selection of Freon* gases, sulfur dioxide, and methyl chloride.

Carried by wholesalers everywhere. Order from one nearest you or contact Refrigeration Division, VIRGINIA SMELTING COMPANY, West Norfolk, Va.
Available in Canada and many other countries

"Virginia" is the only national sales agent and authorized repacker for Du Pont's "Freon" Refrigerants.

D77 Form 523

Printed in U.S.A.

Engineers and Unions?--

(Continued from page 35)

represented is often reported as engineering personnel.

We would question the assumption of the editorial that there has been a weakening in the concept that employed engineers and scientists are a part of management. Our long-time monotoring of this general situation would indicate quite the reverse—that management has constantly improved its concept and practices in recognizing that employed engineers and scientists in the company are identified with management whether they are legally a part of management or not. If you receive our monthly *Engineering Employment Practices Newsletter*, I am sure you have noted the many items reporting on various programs instituted by management throughout the country to encourage professional development of engineers and to enhance the principle that the interest of the engineer is directly related to the interest of the company.

Room for Improvement

This is not to say that there should not be continued improvement and expansion in this area, because this is certainly an urgent need. The point, however, is that the progress is definitely in the direction I have indicated, rather than in the direction of management regarding its employed engineers and scientists as merely another bloc of workers. The comment here would also apply to your statement about management eliminating some of the status symbols of professionalism.

Again, our experience would indicate that the so-called status symbols are increasing in such examples as elimination of clock punching, restriction of engineering titles to qualified engineers, better working facilities, encouragement of registration, authorization and payment to attend professional meetings, etc.

Finally, we believe the concluding paragraph of the editorial does not reflect the current status or recent developments in taking the position that there is a movement of professionals toward collective bargaining and that *now* is the time for management to act.

Crisis Is Over

As indicated above, we believe what ever trend there was has largerly moved past the crisis stage and definitely in the direction of professionalism, and we would further note that management, by and large, has already decided to act and has done so in many significant ways.

Undoubtedly, those in a position to influence opinion toward professionalism should continue to urge the continuation of both trends as much work remains to be done to constantly improve this situation on the part of both the engineers themselves and their companies. Along the line of your interest, we will shortly have available a new survey report by our Professional Engineers Conference Board in Industry, which I think you and your readers will find interesting and revealing.

MILTON F. LUNCH,
Executive Assistant

EDITOR'S COMMENT: The two-way pull on engineers is manifesting itself in these opposing actions; there is movement both toward and away from unionism. It is possible that NSPE is placing unduly optimistic interpretation on such instances as the Sperry and Western Electric instances. Several other professional groups agree that there is a trend toward collective bargaining among professionals, but they prefer not to say so publicly.

Engineers & Scientists of America, which contributed information to the NEWS for inclusion in the editorial is, indeed, ceasing operations. Local associations, however, are maintaining their activity.

'Loud-mouth Salesman'..

You may want to check on some of the more recent setbacks which engineering unions have suffered. It is possible that this may represent a reversal of the general trend.

●

Many sources chose to make verbal or written comments with the understanding that they not be identified:

●

"You can work as an engineer for a company for 15 years; you can help develop major products which prove successful; you can write reports, offer consultation, and the company officers still don't know you well enough to greet you when they see you. In one year, some loud-mouth salesman can make a name for himself and become the fair-haired boy of the firm."—Engineer.

'Slide Rule Pushers'....

"Most of the engineers in our company are not sufficiently creative nor aggressive ever to be anything but slide-rule pushers. While their function is necessary, it is no more or less necessary than that of the lathe operator from an over-all point of view. We honestly wouldn't be hurt in any way if these people joined unions. The one or two men who have what it takes will make it to the top whether or not they are in a collective bargaining group at the moment." — Automotive Manufacturer.

●

"Really professional people, like we consulting engineers, will never join unions. I can see where it might be advantageous for an engineering employe in industry to join."—Consulting Engineer.

'Unionization— Must Be Stopped'

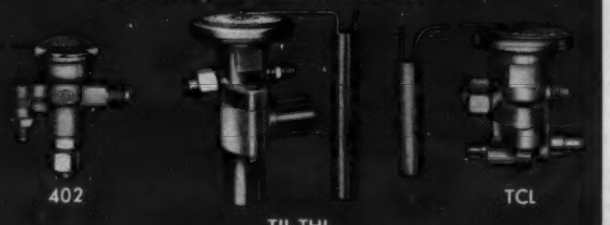
"We were very happy you started the discussion. It is very important to us, but we hesitate to talk about it normally. The unionization of engineers must be stopped; management will not be able to stand up under the combined strength of an organized blue collar and white collar collective bargaining group. Sure, there's less rapport between engineers and management, but unionism isn't the answer."—Manufacturer.

●

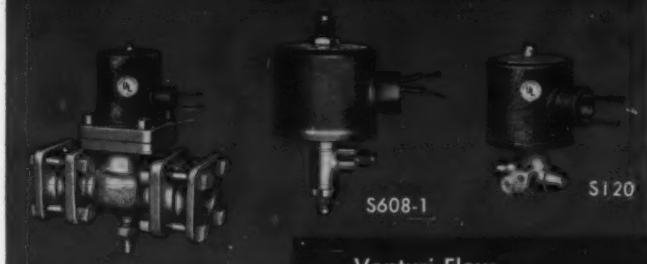
"There is an alternative to joining a union. Switch fields. Go into sales or into production or into administration. The recognition is of a different kind than you originally hoped for, but it pays better."—Vice President, formerly an engineer.

ALCO *the one complete line of* REFRIGERANT CONTROLS

Thermo® EXPANSION VALVES
for all refrigerants from 1/4 to 200 tons



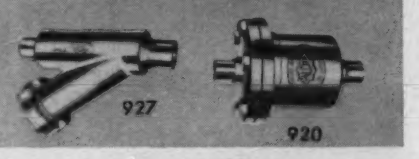
SOLENOID VALVES
Sizes & Type for every application and refrigerant



FOR AIR CONDITIONING AND REFRIGERATION

ALCO VALVES • CONTROLS
STRAINERS • DISTRIBUTORS
FOR EVERY APPLICATION—DIRECT EXPANSION OR FLOODED SYSTEMS

REFRIGERANT STRAINERS
maximum Screen area—
Sizes & Type for every application

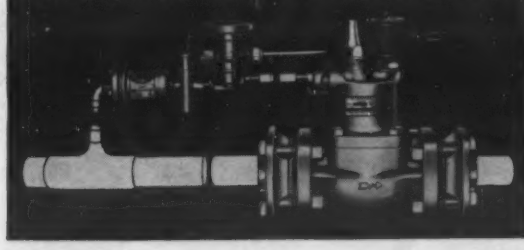


Venturi-Flow DISTRIBUTORS

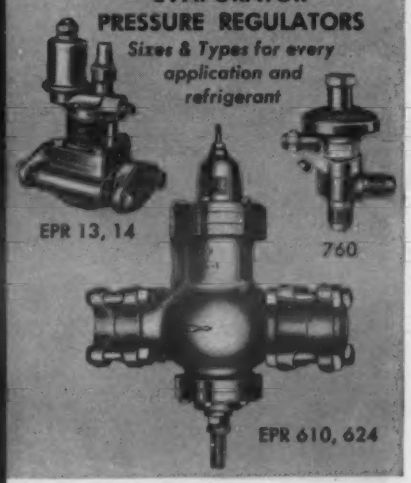
wide application . . . low pressure drop . . . any position . . . one-piece construction . . . no nozzles

Float SWITCHES
for trouble free liquid level control

P.O.S. PILOT OPERATED THERMO® VALVE
with integral solenoid stop . . . for larger installations



EVAPORATOR PRESSURE REGULATORS
Sizes & Types for every application and refrigerant



REFRIGERANT FILTER-DRIER
97% pure Dessicant
Block Form
Silica-Gel PA 400 and Molecular Sieve

ADK

Use and Specify ALCO Controls *the one complete line designed and engineered for efficient trouble free performance.*

See your Alco Wholesaler—Write for Specification Details

ALCO VALVE CO. 853 Kingsland Ave. • St. Louis 30, Mo.

BUY SECURITY • BUY QUALITY • BUY ALCO

The one complete line of refrigerant controls: Thermostatic Expansion Valves • Refrigerant Distributors • Solenoid Valves Refrigerant Filter-Driers • Suction Line Regulators • Flooded Evaporator Controls and Reversing Valves

8217-2

Inside Dope

By GEORGE F. TAUBENECK

(Continued from Page 1)

love lotteries and to fine-feathered friendship.

According to legend, he left a farewell note for the jailer's little girl who had befriended him in prison, and signed it "from your Valentine."

For centuries thereafter "from your Valentine" meant friendship—and nothing more—when affixed to a note or gift sent on Feb. 14 to commemorate the kindly spirit of St. Valentine.

Language Without Words

First serious attempt at mass-produced hearts and flowers was a publication, "Valentine Writer," first issued in 1640. It solved the amateur poet's problems for only a few cents.

From that rag it was an easy step—not even a lover's leap—to the first commercial Valentines, which were sold in England in 1800.

American publishers got into the act about 1840; and by 1857 hearts were beating faster in card-publishing circles at the news that three million Valentines had been sold in the U. S. that year at prices ranging from three cents to thirty dollars apiece.

Tomorrow an estimated 500 million Valentines will be exchanged, or roughly 2.8 greetings per American citizen! (Admittedly, not all of the senders or receivers of these colorful missiles will be love-struck).

Hearts and Glowers

Along with the recent debut of Valentines for Mother, Father, Sister, Cousin and Aunt, the comic Valentine is wisecracking more cynically and successfully than ever.

Nearly half the Valentines exchanged this Feb. 14, 1961, will express such tender sentiments as "Be My Valentine—I adore cheap thrills!" or "You're the dearest, kindest, sweetest husband I know—of course, my experience is limited."

A 1960 classic announced "It's Leap Year, so I'm going to come right out and ask you—could you fix me up with one of your good-looking friends?"

It's not a new trend. "Penny horribles" and "Vinegar Valentines"—so insulting they had to be sent anonymously — have been popular since the turn of the Century.

Remember those grisly cartoon sheets you used to exchange in grammar school?

Let's Take Advantage of This Promotion!

A permanent U.S.A. Trade center, where products of American industry will be displayed and sold the year round, will open in London, England, within the next few months.

This never-closing "trade show" will be under the management of the Department of Commerce in collaboration with the Department of Agriculture.

As a showcase for American goods, it will offer a new dimension to established and potential exporters for introducing (or furthering) sales of their products in British Commonwealth markets.

Attractive display facilities available *at no cost* to the exhibitor—and backed up by aggressive promotion on the part of joint Government-industry teams—will provide an unprecedented "sales package."

This Trade Center is just one of the steps being taken by Washington under an Export Expansion Program designed to correct the imbalance in our international transactions.

Moreover, this London Exhibition will be the first permanent, government-sponsored trade promotion headquarters of its kind ever to be established abroad by the American Government.

Recent removal of most restrictions against our goods by Britain has contributed to the expansion of our trade with the Commonwealth; and it is expected that the Center will accelerate this favorable trend.

Get aboard, fellow citizens!

Tourism In Reverse

In addition to promoting exports, the Trade Center will encourage more Britons to visit the United States.

We can use their money!

The Center will disseminate information on our tourist attractions to travel agencies, tour operators, and international carriers.

Also it will furnish posters and travel literature for the use of these agencies in promoting visits to the United States.

Operated by the Commerce Department's Bureau of Foreign Commerce in conjunction with the Foreign Agriculture Service and U. S. Commercial and Agricultural Attaches in London, the Center will be available to all American producers and exporters.

Stateside producers or exporters of manufactured goods who want to investigate facilities of this new trade promotion Center should direct their inquiries to the nearest Department of Commerce Field Office, or to the Office of Trade Promotion, Bureau of Foreign Commerce, U. S. Department of Commerce, Washington 25, D.C.

Free! Free! Free! Free!

Story of the Week

Father of twin babies got tired of explaining to strangers that, no they weren't both boys.

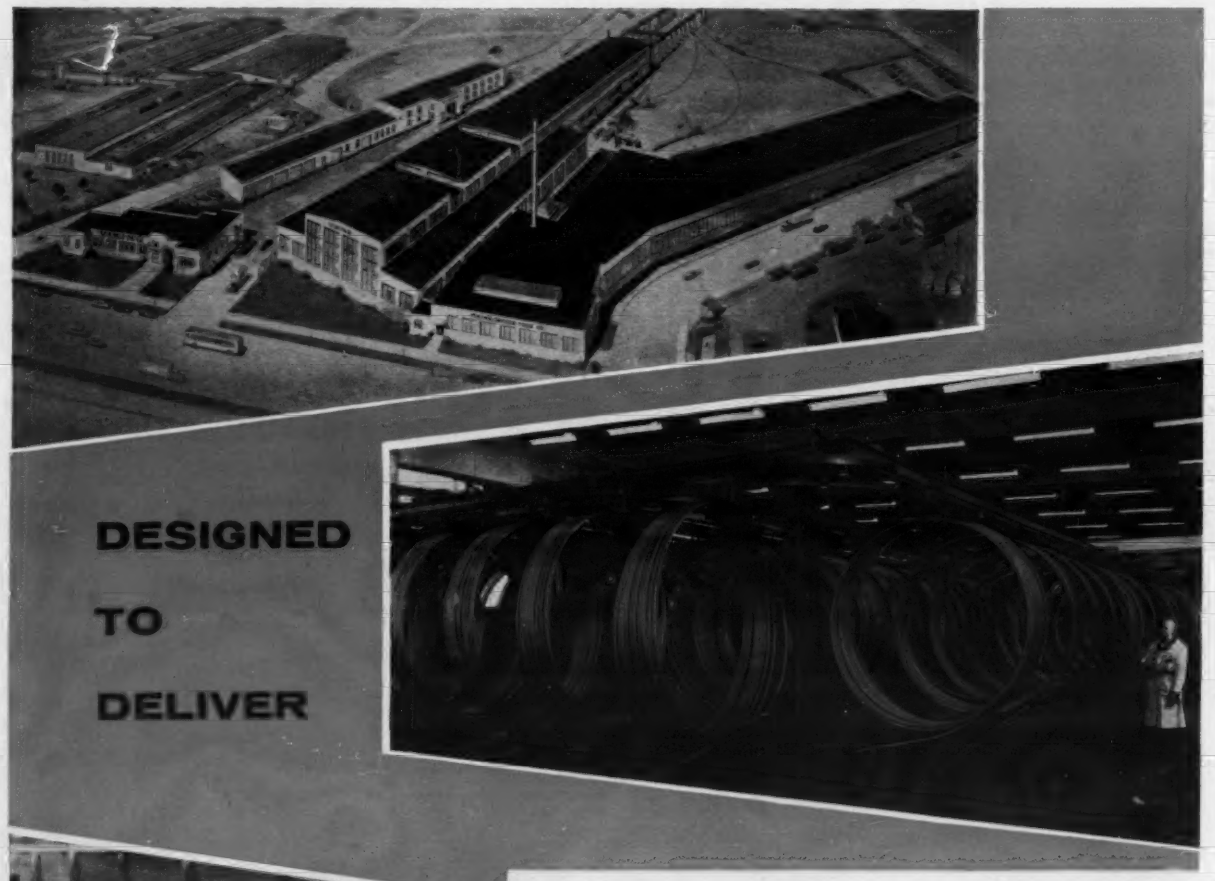
"One is a girl," he advised busybody admirers of his double perambulator. "Confidentially, I have two wives."

Add Newspaper Boners

President-elect Kennedy added that the military must also be efficient "so that the wildest possible use can be made of public funds."—*West Virginia University Daily Athenaeum.*

A survey showed 201 persons roared out of Texas, aimed a staggering punch at the Middle Atlantic states, and out into the Atlantic near Nova Scotia.—*Chicago's American.*

If he refuses to see a doctor, then you must see less marriage and life without children just because your clergyman. You should not be a victim of a kiss-your husband has a problem.—*Pittsburgh Post-Gazette and Sun-Telegraph.*



Other large plants may deliver a variety of products but Viking's spacious, modern plant was designed and built from the ground up for one specific purpose: the production of thin-wall copper tube of unsurpassed quality.

The equipment in the plant whether for fabrication or testing is of special design, built to Viking specifications, or by Viking itself.

So it is with the people of Viking. Each worker is specially trained for a single job — his part in the production of thin-wall copper tube for the leading makers of refrigeration and air conditioning equipment. The entire Viking production team — factory, facilities, men — work to a tradition that demands the best. Is there a better way to insure quality?

VIKING

COPPER TUBE CO.

CLEVELAND 10, OHIO

York Engineers 50-Cycle Room Units for Export

YORK, Pa.—The new 1961 50-cycle room air conditioners from the York Div. of Borg-Warner Corp. have been especially engineered for dependable operation on the wide range of voltage found in the export market, the division announced.

With a power factor in excess of 93%, York's three export models will maintain design performance on 50-cycle current with voltage ranges of 180 to 255 volts, it was noted.

The "Discoverer" (model JB5X-11) has two cooling speeds, two fan speeds, directional air grilles, automatic temperature control, fresh air and exhaust selection, and other features, York said. It is rated at 8,800 Btu.

The "Conqueror" comes in two models, the JN5X-11, rated at 12,000 Btu, and the multi-room model JY5X-11, rated at 12,000 Btu, and the multi-room model JY5X-11, with 16,000 Btu. Both models have a wide range of automatic temperature control, two-speed operation, positive exhaust and fresh air intake, and the exclusive York acoustic design for quieter operation without decreased cooling power, according to the announcement.

"All York export room air conditioners have Cooling Maze Coils for faster cooling and 30% greater humidity removal in addition to Dual Thrust Compressors with automotive type pistons for long life and high efficiency."

The 50-cycle models are available through the York Div. of Borg-Warner International Corp. at 400 Park Ave. in New York City.

Hong Kong Site of Worthington 3rd International Conference Apr. 23

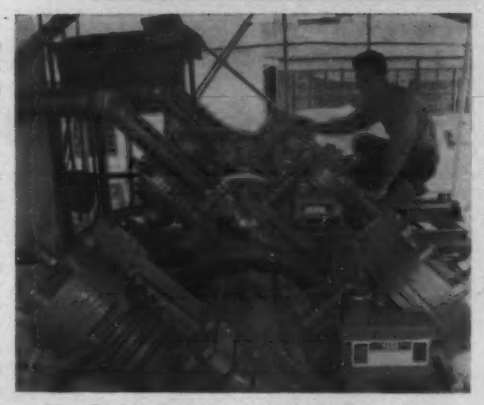
HARRISON, N. J. — Hong Kong has been named as site of Worthington Corp.'s 3rd International Air Conditioning & Refrigeration Conference, it was announced recently by N. A. Gardner, manager, air conditioning products, International Operations.

The conference will be held the week of April 23, 1961. Distributors of Worthington air conditioning and refrigeration equipment from at least 25 countries are expected to attend. The conference will include the introduction of new products, talks on technical advancements, and sessions on marketing, merchandising, and service developments.

According to Gardner, the selection of Hong Kong as the 1961 conference site reflects the growing importance of Southeast Asia and the Far East as markets and the worldwide nature of the air conditioning and refrigeration business.

In addition to distributors and conference speakers, a number of world-known consulting engineers and architects as well as several Worthington top executives and field representatives will attend the meetings. Official host for the conference will be Yee On Hong Co. Ltd., Worthington distributor in Hong Kong.

Previous Worthington distributor conferences have been held in Havana, Cuba and San Juan, Puerto Rico.



YEE CHEW, a name indigenous to Kowloon, China is acquainted with Brunner, a name indigenous to 'round the world air conditioning. Chew is shown checking four Brunner compressors totalling 140 hp that control temperature and humidity at Eastern Cotton Mill, first mill in the area to install air conditioning. Control temperature at Eastern is 80° to 90°F with humidity range 52% to 65% at all times in carding, spindle, and warping areas. Compressors are manufactured by Brunner Div., Dunham-Bush, West Hartford, Conn., U.S.A.

Controls of America Forms British Firm

SCHILLER PARK, Ill.—Controls Co. of America has announced organization of Controls Co. of America (U.K) Ltd. to manufacture and sell heating and appliance controls in Great Britain.

A factory located in Woking, Surrey, has been purchased and operations are expected to begin during the first quarter of 1961.

The new company will be under the direction of D. A. O'Leary, who is also president of Controls Co.'s Canadian subsidiary.

American Products Face Competition In Guatemala

GUATEMALA CITY, Guatemala — Refrigeration and food display equipment and fixtures for supermarkets are finding a growing market in Guatemala that American manufacturers could effectively exploit, the U. S. Embassy here reports.

Tobias Hartwick, second secretary of the embassy, commented that United States manufactured goods have enjoyed a great popularity in Guatemala since World War II.

As a result, he note, Guatemala has built up repair facilities, supplies of parts, and experience in working with and servicing U. S. made products.

However, he adds, foreign and particularly European competitors, have been making an impression on Guatemalans with a campaign citing their products as better made, cheaper, simpler, and more adaptable to Guatemalan needs.

Therefore, he said, representatives of U. S. firms should be well informed about the weak and strong points of competitive products as well as their own to counter this campaign.

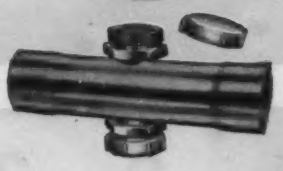
HENRY VALVE CO.
CONTROLLING FLOW SINCE 1914

DEMAND IS GREAT... EVERYONE IS BUYING THESE EXTRA VALUE PRODUCTS

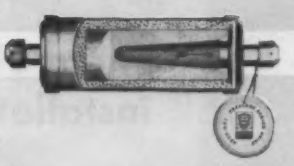
"DRI-VUE" Moisture-Liquid Indicators | "DRI-COR" Filter-Driers Molded Core | "GOLDEN BANTAM" Diaphragm Packless Valves

"DRI-VUE" INDICATOR PORT
Actually Spells "WET" or "DRY" with element Color Variation—Largest Visible Element Area.

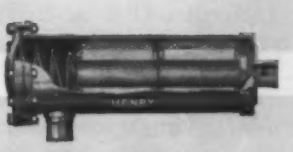
"DRI-VUE" INDICATORS
Double Port Moisture-Liquid Indicators, Large O.D.S. Sizes. Triple Sealed Ports.



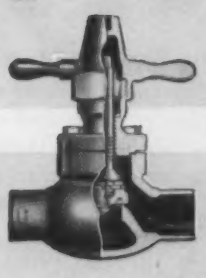
"DRI-COR" FILTER-DRIERS
Two Stage Drying; Molded Core and Granular Desiccant. Abso-dry Processed.



"DRI-COR" Cartridge DRIERS
Molded Filter Core and Granular Desiccant. Split Second Cartridge Installation.



SHUT-OFF VALVES
Packless and Packed with Flanged and Integral Connections. Wide Range of Sizes and Types.



Only Henry offers you this complete variety of types and sizes, from ¼" flare packless to 4⅛" O.D.S. packed Wing Cap valves, from 1 ton sealed type to 165 ton cartridge type filter-driers and ¼" flare single port to 2⅛" O.D.S. double port moisture indicators.

HENRY VALVE COMPANY
For Refrigeration, Air Conditioning and Industrial Applications
MELROSE PARK, ILLINOIS, U.S.A. CABLE: HEVALCO, MELROSE PARK, ILL.

'White Rooms' Offer Expanding, Challenging Market for Supplier, Engineer Contractor

PORTION of assembly line in class six white room at McDonnell Aircraft Corp. plant. Workers are assembling "Project Mercury" space capsules, in which first American astronauts will go into orbital flight.

By George M. Hanning

DETROIT — An exciting and expanding market for air conditioning equipment, one that challenges the ingenuity of supplier, engineer, and contractor alike, lies in industry's growing need for and use of dust-free and/or bacteria-free "white rooms."

White Room Engineers Form Association

This is a field so new that only in the past few months has a group of "white room" engineers come together to form an association to be known as the American Society for the Control of Contaminated Areas.

First task of this group when organized will be to set up standards and design criteria. Progress is moving so rapidly that the "ultimate" in white rooms of a few years ago are already obsolete.

The need for these white rooms, where cleanliness, temperature, and humidity are regulated to a far higher degree than in conventional air conditioning, rises out of the growing number of high precision, miniaturized, and microminiaturized products and parts demanded by the space program, industry, and consumers.

Such products range all the way from missile gyroscopes to transistorized hearing aids. They also include semi-conductors, inertial navigation systems, ball bearings, printed circuitry, electronic data processing machines, pharmaceuticals, and control instruments.

What Are Advantages Of White Rooms?

What advantage does the white room offer to manufacturers? Are the worth their higher than normal cost?

W. R. Jerome recently offered this testimonial to the benefits of white rooms to Autonetics Div. of North American Aviation Corp. The division makes inertial navigation systems, computers and data systems, armament and flight controls, and industrial products including a desk top general purpose computer for commercial use.

"Autonetics has, at the present time," he said, "four dust controlled areas with a combined total floor space of 43,000 sq ft or about one acre.

"The air conditioning system in the dust controlled rooms operates 24 hours a day, seven days a week. It provides a plus or minus ½° temperature, a relative humidity between 25 and 40%, and a dust concentration below 10 particles over .5 microns in size per cu ft. (A particle of 35 microns is the smallest a human eye can see). Pressure in the controlled areas is kept at about ¼ in. of water above the pressure in adjacent areas.

"If the air conditioning system fails, or has to be shut down, the room must be evacuated until the system has again been operational for at least one hour, the room mopped out, and the dust count down to normal.

Original Cost More Than Justified by Results Obtained

"We at Autonetics are convinced that the original cost of constructing the dust controlled areas has been more than justified by the results obtained. The incorporation of dust controlled areas into our manufacturing processes has statistically paid off in time saved, cost reductions, and finally, component and system reliability.

"Gyroscopes, one of our minor product lines, were previously one of our major problems. One of our early gyros, the G-2, averaged, for every 10 gyros built, 120 reworks before passing inspection. That's an average of 12 reworks per gyro.

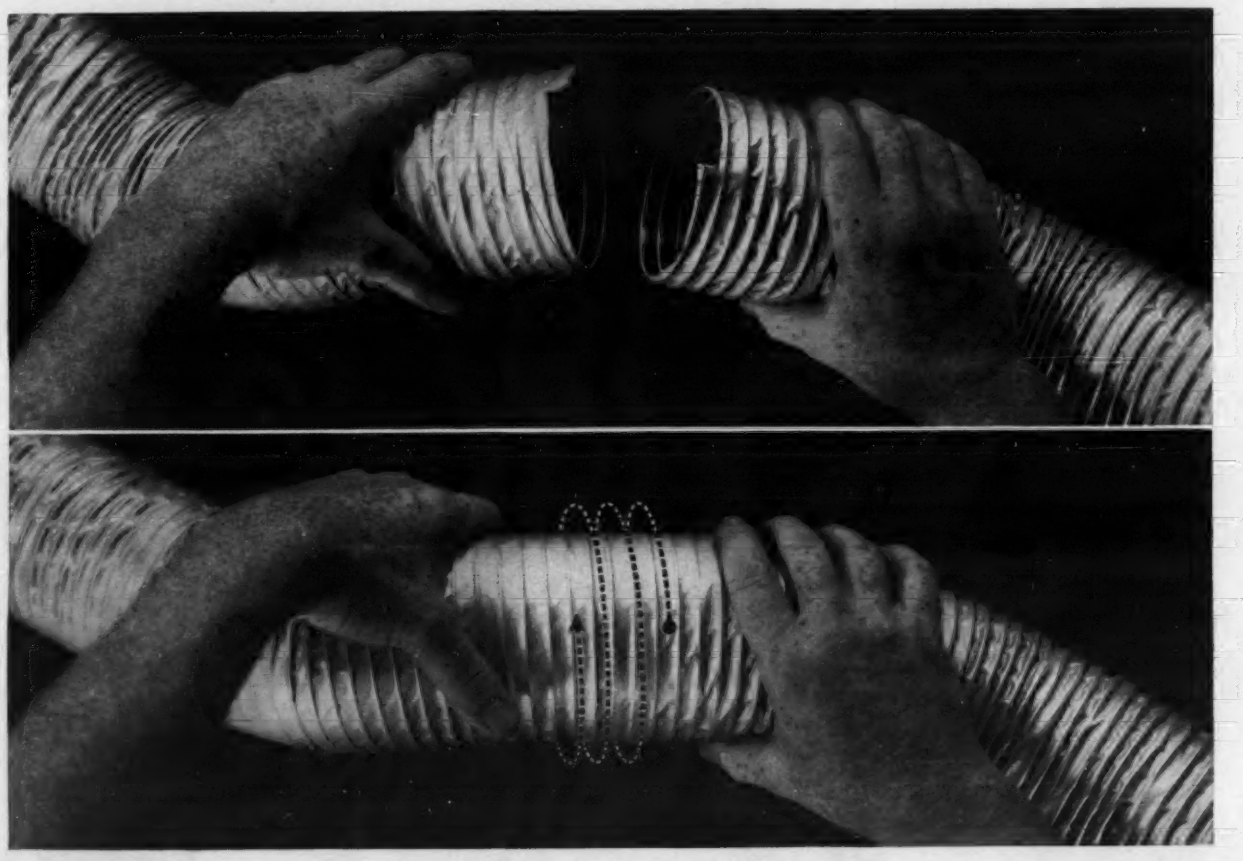
"Upon construction of the dust controlled area, for every 10 gyros built, only two were subject to rework; total reduction of the rework rate from 1,200% to 20%.

"From the lamentable statistics of the military electronic equipment used in the Korean War—over 1 million replacement parts for only 160,000 units of equipment . . . radar equipment inoperative 84% of the time—sonar equipment 48% of the time. . . . Autonetics has, in less than a decade, reduced the inoperative time of its electronic and electro-mechanical equipment to a negligible factor.

Fire Control System Achieves 92% Reliability In Overseas Operation

"Our MG-4 fire control system has achieved a 92% reliability rate in overseas operation. Autonetics NADAR's, the airborne data recorders, have a

(Continued on page 47)



1...2...3 turns and they're spliced

Thermaflex®-ST lengths connect easily to speed installation...reduce waste...save you money!

Thermaflex-ST is the highly flexible duct especially designed for run-outs in the air conditioning systems you install. Two lengths of lightweight Thermaflex-ST can be screwed together right on the job. 3 turns and you have an airtight connection. Advantages: faster installation, fewer throw-away pieces—and big savings for you!

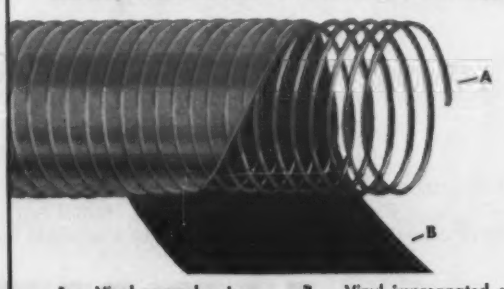
Resists flame, moisture . . . cuts vibration, noise

Thermaflex is flame-resistant, moisture-resistant . . . reduces vibration and noise. It offers outstanding airflow efficiency, too. Unlike other nonrigid ducts, Thermaflex's cover and wire reinforcement are *permanently bonded*. Thermaflex materials are approved by Underwriters' Laboratories.

Thermaflex is a product of Flexible Tubing Corporation, leading manufacturer of nonmetallic duct. Write for name of the authorized Thermaflex representative nearest you.

SEE YOU AT THE SHOW — BOOTH 320

See why THERMAFLEX-ST is so flexible and rugged!

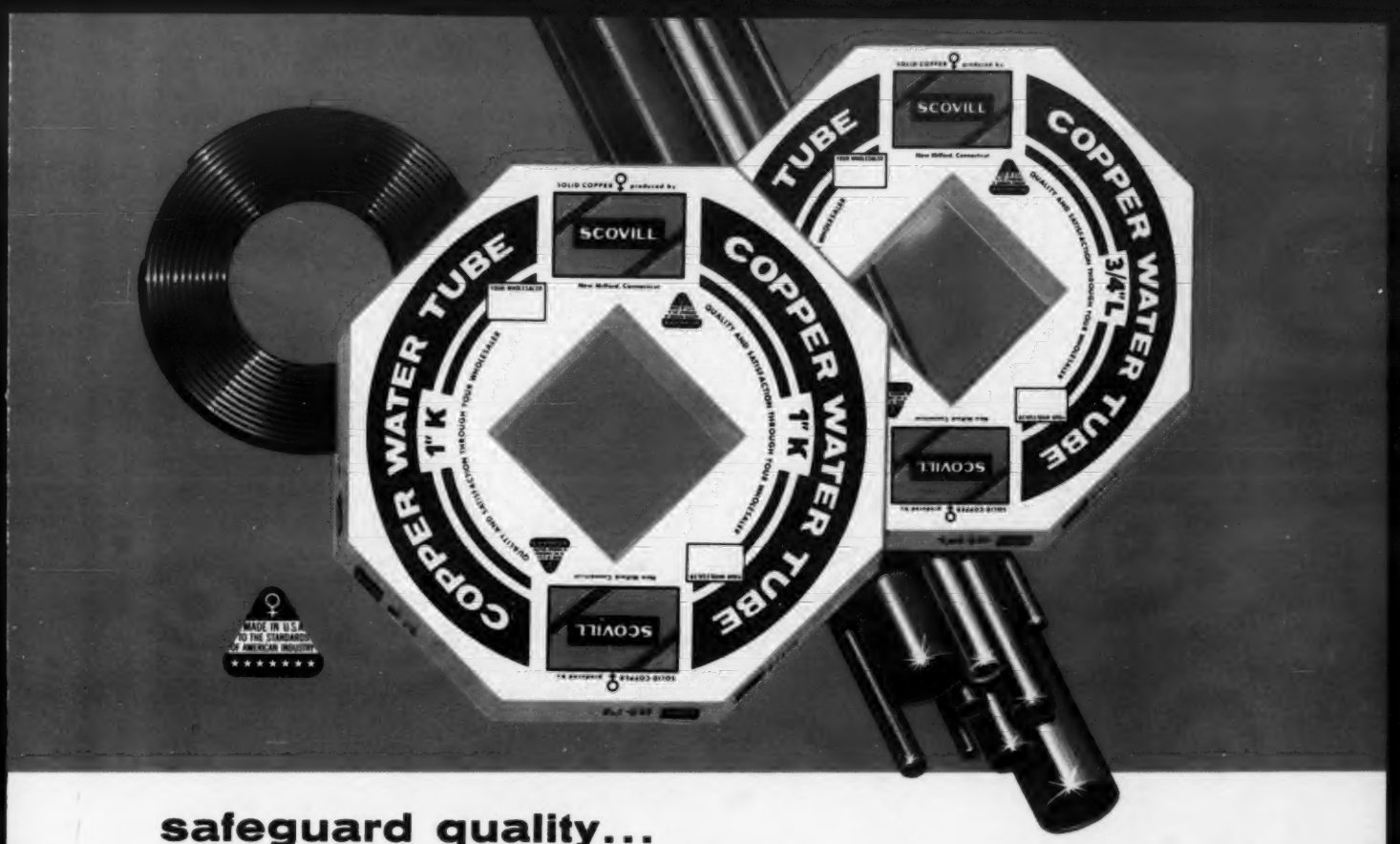


A — Vinyl covered spring steel wire helix.

B — Vinyl impregnated and coated fiber glass cover.

Flexible Tubing
CORPORATION
212 New Whitfield St., Guilford, Connecticut

Three shipping points give you fast delivery on Thermaflex: GUILFORD, CONNECTICUT • ANAHEIM, CALIFORNIA • HILLSIDE, ILLINOIS



safeguard quality...

name your brand...

and look for the MADE IN USA

there's no finer ***quality control*** *than that which safeguards*

SCOVILL®

made better to bring out the BEST in every installation

Smart contractors have learned that it pays more than ever today to be *sure* of the quality of materials going into every job, large or small.

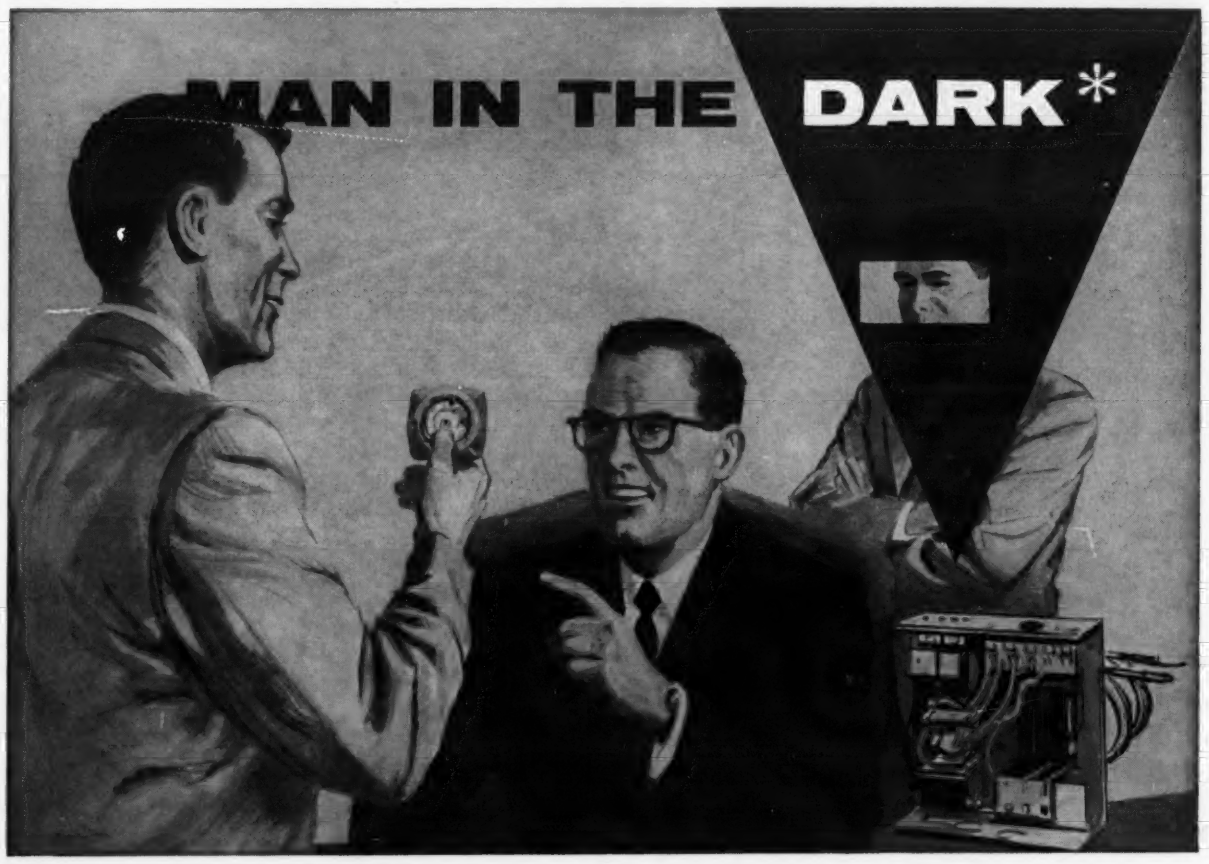
There's only one way to do this . . . NAME YOUR BRAND and look for the MADE IN U.S.A. Only when you do this do you enjoy the full quality-protection of your own tight U.S. industry standards.

So, the next time you visit your Wholesaler, call for Scovill.

copper
refrigeration tube

COPPER WATER TUBE K-L-M
COPPER THREADLESS PIPE (TP)
RED BRASS PIPE
COPPER PIPE
COPPER DRAINAGE TUBE (DWV)
PLUMBERS BRASS GOODS

SCOVILL MANUFACTURING COMPANY · COPPER TUBE MILL PRODUCTS, WATERBURY 20, CONN.
11SC60



"If only I'd known about that a week ago!"

There's no room for second-guessing in the fast-moving world of air conditioning, heating and refrigeration. It takes a man armed with *current* facts to build a brighter future for himself and his company – and yours!

That's why you'll find no "men in the dark" among the 22,000 plus decision-makers who subscribe to AIR CONDITIONING, HEATING & REFRIGERATION NEWS, the *only* weekly newspaper serving their industry.

These are men equipped to act! They're prepared, because the NEWS gives them a week-by-week report on the latest products, manufacturing methods, installation procedures, and vitally important sales and merchandising trends.

These are the men you can reach every week through the NEWS: equipment manufacturers, consulting engineers and architects, residential, commercial and industrial service and installation contractors, dealers, distributors and field sales-service personnel.

Don't keep this influential audience in the dark about *your* products and services. Give your sales message the attention it deserves by advertising regularly in the NEWS – the publication that's first with all the news!

See your local NEWS Representative soon. He'll gladly show you facts and figures that can throw new light on your sales picture.

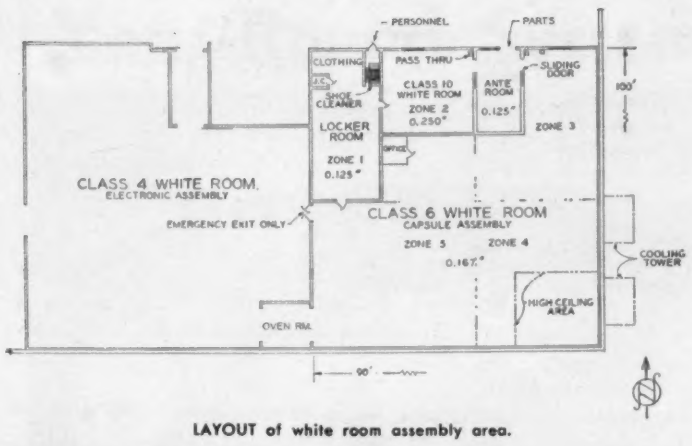
AIR CONDITIONING HEATING & REFRIGERATION **NEWS**

450 WEST FORT STREET, DETROIT 26, MICHIGAN

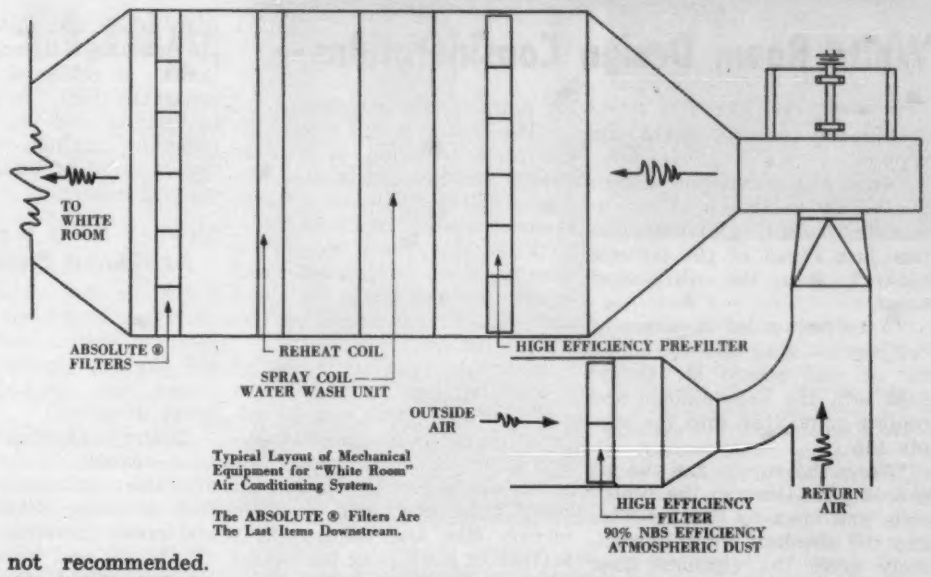
NEW YORK: .....521 Fifth Avenue, MUrray Hill 2-1928-9.
CHICAGO: .....134 South LaSalle Street, FRanklin 2-8643-4.
LOS ANGELES: .....4710 Crenshaw Blvd., AXminister 2-9501.
DETROIT: .....450 West Fort Street, WOodward 2-0924.

THE ONLY WEEKLY NEWSPAPER

Reaching these MARKETS	Serving these FIELDS
• Air Conditioning	• Residential
• Heating	• Commercial
• Refrigeration	• Industrial



LAYOUT of white room assembly area.



Typical Layout of Mechanical Equipment for "White Room" Air Conditioning System.

The ABSOLUTE ® Filters Are The Last Items Downstream.

IN THIS mechanical equipment layout for single duct central system, note position of super-interception filter. Filter *must* be last item of mechanical equipment downstream before ductwork.

White Room Requirements--

(Continued from page 44)

98% in-flight reliability factor. Over 140,000 hours of operation have been logged by Autonetics gyros while maintaining specified high performance."

Jerome added that this high reliability rate has been achieved with a smaller number of inspectors.

"Autonetics has an average 30% fewer inspection personnel than comparable military electronics firms. And part of the reason for increased reliability and less inspection personnel are the dust controlled areas used for the initial fabrication and inspection of precision assemblies and components."

White Room Requirements

What does the "white room" require from the air conditioning manufacturer, engineer, and installer — aside from ever-better equipment, more ingenuity in design, and more thoughtful installing?

Here are some of the factors that must be considered, as outlined by Dr. Alvin Lieberman of the Armour Research Foundation:

"The air supply system is required to supply clean, filtered air with the correct relative humidity to the room. A sufficient volume of air is required so that at least 12 and no more than 20 air changes per hour are supplied.

"At higher air change rates, cost considerations are of importance and air velocities will increase to a point where reentrainment of settled dust from surfaces can take place.

"At change rates much less than 12 per hour, it is not possible completely to exhaust dust and contamination produced in the room.

Relative Humidity Range Critical

"The air supply system is required to supply air with a relative humidity ranging from 40 to 60%. At relative humidities less than 40%, it is found that static electricity charges appear, causing problems of comfort and personnel safety.

"At relative humidities higher than 60% operating personnel begin to feel uncomfortable. When relative humidity becomes too high, oxidation of exposed ferrous surfaces is promoted.

"In practice, makeup air amounting to 10 to 40% of total air circulated into the room is required to take care of leaks and to permit fresh air to be fed into the room.

"Some precautions are necessary in choosing the makeup air intake point. Several rooms have been seen where makeup air intakes have been directly downwind of paint spraying or acid treating exhausts, power plant stacks, etc.

"This is not recommended. Filters can be overloaded in this way very rapidly. If at all possible, it is recommended that makeup air be taken from air

(Continued on next page)

Acid Corrosion "wears" out refrigeration parts fast

Control moisture and corrosion with PA® 400

Today, of course, the refrigeration engineer, mechanic, or manufacturer would probably agree that PA 400 is the one best desiccant for the control of moisture and its by-product, acid, in refrigeration systems. PA 400 effectively drops moisture levels in refrigerant gases to less than 10 parts per million . . . its full flow filtering action captures scale, sludge and foreign matter as small as 1 micron. PA 400 is the refrigeration man's best ally in the battle against acid corrosion. PA 400 effectively holds acids in the desiccant . . . and removes acids if they have already formed. If you are not now using Davison PA 400 for efficient dehydration in your refrigeration equipment, write Dept. 2602 for full information.

GRACE

DAVISON CHEMICAL

BALTIMORE 3, MARYLAND

White Room Design Considerations--

(Continued from preceding page)

conditioned general plant air supply.

"From the standpoint of contamination control it is important to place the filtering system just ahead of the diffuser network into the ultra-clean room.

"A recommended sequence of components is as follows: make-up air and return air should feed into the dehumidifier and cooling coils, then into the supply fan.

"From the supply fan the air should pass through the reheat coils and then to the pre-filter and the absolute filter. Immediately after the absolute filter the air should be sent into the diffusers.

"Even though the filtering section is placed after the reheat coil with a resultant increase in the filter capacity required, the cleanliness of the air supply to the room makes up for the increased cost of the filters and the larger fan.

"Our experience has been that an electronic precipitator or a mechanical filter is suitable as a pre-filter. The final filtering, however, must be done with mechanical filters of the so-called absolute type; either glass fiber or asbestos-cellulose fiber filters are suitable.

"As far as diffuser design is concerned, it has been our experience that either vaned diffusers or flat plate diffusers are equally suitable. The diffusers should be in the ceilings and exhausts should be at floor level.

Placement of Diffusers

"Placement of diffusers and exhausts will depend upon layout of the room and the work positions within the room. The paramount requirement here is to establish a downward wash of air from the diffuser over the work surface to the exhausts.

"Extreme care must be taken in setting up the filter racks. It is necessary to insure that no leaks occur between filter elements or between filter elements and duct surfaces.

"If at all possible, it is felt that all welded, stainless steel ducting is superior to any other type. In-leakage of non-conditioned air is eliminated, surface reactions are minimized, and cleaning is more effectively done.

"In addition, loss of costly conditioned air is prevented."

Other observations on air conditioning systems for white rooms were made recently by Arthur K. Baker, president of Baker Instruments, Inc. of Chandler, Ariz. His suggestions:

"First, a liberal use of stainless steel (in white rooms). . . . Aluminum is suspect wherever there is humidity. Even anodizing does not seem to lick the problem. . . . Some companies have used aluminum ducts, chiefly in California, and we have not heard complaints. But another company in Rhode Island had plenty of trouble.

"Galvanized air ducts after the final filter are trouble makers. Particularly rust spots where galvanized sheet has been formed or bent and the zinc coating fractured. In California, this rust will migrate through air ducts within two years. . . .

"The ceiling is the most logical place to bring in the air supply through ducts and diffusers and not through a hard-to-clean plenum chamber.

"First, the incoming air is usually air conditioned and cooler than the air in the room and will fall downward by virtue of its greater density.

"Secondly, various types of continuous line inlet diffusers are available which can be adjusted to give a thorough sweeping effect to the incoming air to eliminate dead and stagnant spots that can hold dust in motion like the always dirty surface of a whirling backwater eddy in a flowing stream.

"The air should be changed in the room at least 20 times per hour, which does not usually mean supplying 20 new completely different air conditioned units of air, but rather that the air flows back through the system to be refiltered at least 20 times and that the makeup air is brought into the system as necessary to keep pressure on the room of at least 0.1 in. of water pressure.

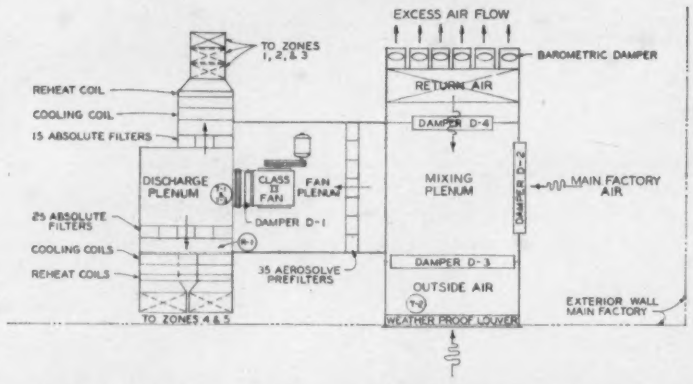
Cleanest Room Kept At Highest Pressure

"In the case of several adjacent dust controlled rooms, the cleanest one is maintained at the highest pressure and the others are stepped down to lower pressure.

"Many applications, of course, have noxious or chemically undesirable substances released from processes within the room, and must, therefore, dispose of all the air and bring in a continuous supply of new air.

"This system will, of course, raise the cost of the air conditioning system. And the cost of the air conditioning system is one of the major variables in the cost of the white room. . . .

"It is now possible," Baker pointed out, "to design equipment so that the air will have been filtered as many as seven times through varying types of filters or absorbers to eliminate almost any reasonable size of dust, to eliminate almost all water vapor from the environmental atmosphere surrounding the work, and to eliminate almost any type of airborne chemical contaminant or to re-impregnate the atmosphere with any desired controlled substance, or to even supply an artificial atmosphere composed of other gases or a mixture thereof."



PLAN VIEW showing layout of white room air handling system, located in truss of main factory building.

Coming soon from

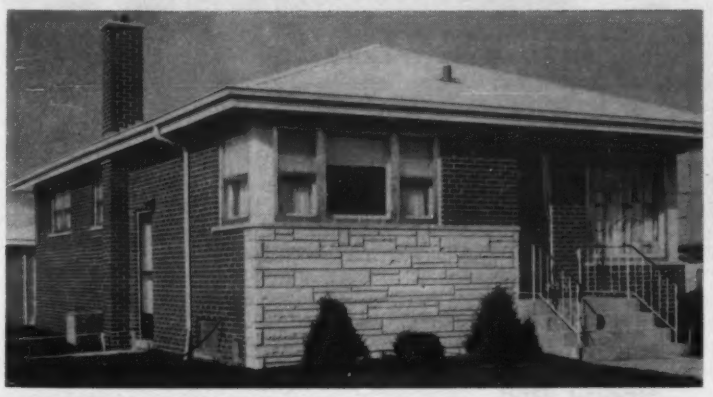
NEW! Simple field test for hermetic burnouts

plus

NEW! Easy way to clean out mildly contaminated systems

Full information on these important new developments—plus test kits and pressurized cylinders of "Genetron" 11—will be available from your wholesaler about March 15. See him then!

Year-Round System for $1,000



IN HOMES SUCH as this on Chicago's west side, Division Heating, Inc. is installing gas heating, self-contained 2-ton air conditioning, and all ductwork for $1,000! Two men install the entire heating system, including ductwork, in 10 hours at the job site. They require only 90 minutes additional time—including travel time—to install the Carrier "Thermo-Center" air conditioner. In this picture, the air conditioner can be seen projecting through the foundation next to the chimney.

CLOSE COORDINATION between Arnold Levy (l.) builder of Castle Homes, who sold 128 air conditioned houses last year, and Vincent DeStafano, president of Division Heating, is required to produce smooth flowing, time saving installations. Builder Levy comments: "Air conditioning builds goodwill for me. Even though a prospect tries to talk me into selling him a house at a lower price without air conditioning, I decline. I know that he will be grateful for the air conditioning and will talk about it to his friends. Removing cooling will only save him about $400."

STOCKPILE of finished ductwork and sheet metal components for Castle Homes and other builders is maintained by Division Heating. This way, the company can send an installation crew out on short notice with all prefabricated parts needed for a home.

AT RIGHT is the wall sleeve which is actually built into the house. Inside the wall sleeve is a special transition assembly which guides air in and out of the cooling unit when cooling is called for. Next comes the opening to the furnace plenum with splitter centered within it. This splitter divides the plenum into two parts and even extends a few inches into the ductwork. Division spends about three hours fabricating a plenum (three sides and top), a splitter, and a few other sheet metal duct sections. Wall sleeves are delivered to the builder. The masonry contractor puts them in place in the same fashion he does cellar windows. He lays one course of bricks under the wall sleeve and one course of bricks above. No lintel is necessary because the wall sleeve is 14-gauge steel.

General Chemical

General Chemical takes the guesswork out of hermetic burnouts

One of the oldest and toughest service problems in the refrigeration and air-conditioning industry has been licked!

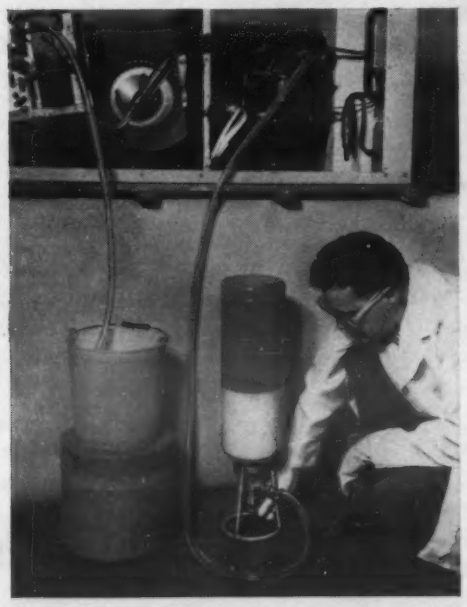
Until now, there was no quick, on-the-spot test to determine the degree of acidity in a system after hermetic burnout . . . and there was no easy way to tell when the acid in a system had been cleaned out.

To solve this problem, General Chemical has developed the first simple field test for checking degree of contamination in a burned-out system—before and after cleanout. Yes—we've taken the guesswork out of hermetic burnouts.

In addition, General Chemical has developed an easy, short-cut procedure for cleaning out mildly contaminated systems by using pressurized cylinders of "Genetron" 11 to flush the unit—quickly and without pumping.

See how these new developments can save you time, labor and material costs:

First practical field test method! With this handy, portable kit developed by General Chemical, you can now quickly and easily determine extent of contamination in a system after hermetic burnout. Simple tests show extent of burnout contamination and what clean-up procedure should be used. Also show when cleaning is complete.



New quick, easy way to clean minor burnouts! Mildly contaminated systems can now be flushed and cleaned without pumping by using special new pressurized cylinders of "Genetron" 11 solvent. Prepared especially for flushing burnouts, these pressurized cylinders will soon be available from your wholesaler. An excellent solvent, "Genetron" 11 flushes acids and moisture, loosens and removes solids and is safe to handle.

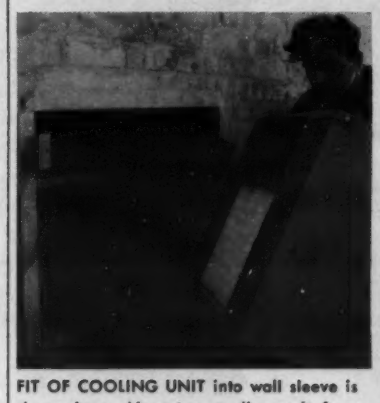
Here is still another contribution by General Chemical to the advancement of the air conditioning and refrigeration industry. These new procedures will be demonstrated at the International Heating & Air-Conditioning Exposition, Chicago, February 13-16, at "Genetron" Booth #43 . . . and will be shown to RSES and other groups throughout the country in weeks to come.

genetron®
super-dry refrigerants

Allied Chemical

GENERAL CHEMICAL DIVISION
40 Rector Street, New York 6, N.Y.

WORKMAN installs foam rubber gasket with adhesive backing around the edges of the wall sleeve.



FIT OF COOLING UNIT into wall sleeve is shown here. Air enters cooling unit from lower section of wall opening, is drawn across cooling coil in lower section of unit. Air is discharged into furnace plenum through upper opening of cooling unit. Unit is bolted into snug fitting wall sleeve by flange pieces.

THERMO-CENTER location next to exterior wall frees basement space for future development. Air from five air return grilles along center of house is ducted to bottom of upflow furnace at right. A short duct from the top of the furnace plenum takes conditioned air to center trunk duct which runs the length of the house.

AN INTERNATIONAL INSTITUTION • SUBSCRIBERS ALL OVER THE WORLD

Trade Mark reg. U.S. Pat. Office; Est. 1928

AIR CONDITIONING HEATING & REFRIGERATION NEWS

Copyright 1961, Business News Publishing Co.

F. M. COCKRELL, *Founder*

'The Conscience of the Industry'

Published Every Monday by BUSINESS NEWS PUBLISHING CO., 450 W. Fort St., Detroit 26, Mich. Telephone Woodward 2-0924. Subscription Rates: U. S. and Possessions and Canada: $6.00 per year; 2 years, $9.00; 3 years, $12.00. All other countries: $10 per year. Single copy price, 40 cents. Ten or more copies, 30 cents; 50 or more copies, 20 cents each. Send remittance with order.

PUBLISHER, George F. Taubeneck
EDITORIAL DIRECTOR, Phil B. Redeker
EDITOR, Frank J. Versagi
ASSOCIATE EDITOR, C. Dale Mericle
ASSISTANT EDITORS: John Sweet, Hugh Mahar, George Hanning
EDITORIAL ASST., Terry Treiber
RESEARCH & PROMOTION DIRECTOR, John MacLean
GEN. PROD. MGR., Walter Schuler
ADV. PROD. MGR., A. M. Barrow
CIRCULATION MGR., Rosalie Ashley
SUBSCRIPTION MGR., Deloris Krol
READER'S SERVICE MGR., Edith King

PRESIDENT, Edward L. Henderson
VICE PRESIDENT & SALES DIRECTOR, Robert M. Price
VICE PRESIDENT & ADV. MGR., Allen Schildhammer
WESTERN ADV. MGR., Rex Smith
EASTERN ADV. MGR., Frank Taylor

ADVERTISING OFFICES:
New York, 521 Fifth Ave. MUrray Hill 2-1928-9 — Robert M. Price, Frank Taylor
Chicago, 134 S. LaSalle St. FRanklin 2-8643-4 — Rex Smith, Dave Ryden
Detroit, 450 W. Fort St. WOodward 2-0924 — Allen Schildhammer, Charles Pokorny
Los Angeles, 4710 Crenshaw Blvd. AXminster 2-9501 — Justin Hannon

Member, Audit Bureau of Circulations. Member, Associated Business Publications.

VOLUME 92, NO. 7, SERIAL NO. 1,664, FEBRUARY 13, 1961

Editorial

By 1970—A Look Ahead

CRITICS OF the heating-cooling industry complain that for 25 years there have been no real engineering developments—only rearrangement of already existing components. (Critics, you know, are those people who never do anything themselves but who can always tell you how something you've just accomplished could have been done better.)

This same reasoning is applied by those who complain of the automobile industry, "After all, there are four wheels and a motor under the hood, just like when they started."

It is logical to suppose that these people would complain that the wheel is still round after several thousand years, and that no one has altered the six simple machines we all learned about in physics. Actually, such critics are confusing the discovery of new principles, of which there are few, with the myriad of possibilities of adaptation and derivation of these principles; it is adaptation and derivation which are in major part responsible for our technological progress.

Compare the electric air conditioners being displayed during the 15th International Heating & Air Conditioning Exposition with units of 15-25 years ago.

Today's units are smaller, yet more efficient. Compressor size per horsepower is drastically reduced over a few years ago. The cost—in dollars per ton of cooling—is far below that of earlier units. Anyone who is not blind can see that there has been progress, real progress.

But what of the years ahead? Where will heating-cooling technology be in 1970? No one knows for sure, but here are some expectations—practical expectations which do not include solar heat and fuel cells. By 1970, these latter items should be in the pilot stage—equivalent to the present status of atomic generation of electrical power.

In Heating

● Electric heat will become part of the family. While falling short of utility optimistic forecasts, resistance heat will be accepted by enough customers to make it unwise for a heating contractor to handle only warm air or only hydronics.

The present argument over the relative merits of baseboard and ducted electric heat will still be going on, but customers will be there for both kinds.

● By 1970, heat pumps should really have broken the geographical barrier. Enthusiasts insist that they have already done so, but a realistic appraisal shows that there is much to be done before heat pumps can be generally applied in residences in colder climates. Much is being done, and it should lead to broader acceptance of reverse cycle systems, although it is difficult to see that heat pumps can ever be more than a healthy minority in the population of heating systems.

● So, too, will hydronics be a minority form of heating, although its share of the market will surely grow. What may hurt the growth of hydronics is the attempt to make its installed cost directly competitive with warm air. A good wet heat system does a wonderful job, but it costs more to install. If enough corners are cut to make the hydronics installation compete with warm air, well – – –

● Warm air heating will roll on its merry way. Perhaps a couple of the patents which indicate a possibility of obtaining more efficient burner operation (higher heat for either gas or oil flames) will have an impact. Perhaps, too, the experimental use of thermoelectric power generation to operate fans and blowers without recourse to external electric power will become practical.

But the great hope for warm air heating is that contractors can be trained to install systems which give all the comfort inherent in the equipment—comfort which isn't supplied in the majority of installations today.

● Infrared heating should become more prominent. It lends itself well to spot-heating and area-heating applications.

In Air Conditioning

● Gas air conditioning will be the newsmaker in comfort cooling during the next decade. The growth curve of gas air conditioning is running parallel to the early growth curve of electric cooling.

Two absorption units have already proved successful for residential and small commercial applications; a third unit will be introduced within a year or two. Large-tonnage absorption equipment is attracting more producers and will compete with centrifugal equipment for major installations.

Engine-driven gas equipment in larger tonnages is finding increased acceptance. Two, possibly three, non-industry companies are looking hard at the free-piston compressor for cooling applications above 20 tons.

● In the striving for still smaller, more efficient electric air conditioners, we can expect to see more high-speed (2-pole, 3,600 rpm) motor-compressors.

● For humidity and capacity control there will be more frequent use of multi-cylinder compressors and of twin compressors. We may see new attempts to apply two-speed compressors in spite of earlier difficulties with prototypes.

● The increasing emphasis on humidity control will bring about more use of reheat systems, both in central and room units.

● Adhesive bonding of joints will become more common—making it possible to use dissimilar metals with more confidence.

● Exact accounting procedures, now being applied specifically to the study of air conditioning, will finally make it possible to prove the effects of air conditioning in a plant or office. Similar accounting methods will permit the correct choice between a central system and packaged units for large-tonnage, multi-zoned installations.

● Air treatment — electronic, ionic, ozone — will have been evaluated and incorporated into central systems. Present claims for "air purifiers" will have been realistically appraised by government, and standards will be adopted.

In Refrigeration

The reach for lower temperatures will guide developments in refrigeration for the next several years.

● Justified delaying action being fought against the more stringent frozen food codes will give way as manufacturers have time to incorporate new designs into production. Use of internally compounded (two-stage) compressors in supermarkets will become frequent.

● Romantic cryogenic applications of ultra-low temperature refrigeration will become less romantic and more practically common. Multi-staging and cascading will become familiar to manufacturers, engineers, contractors, and servicemen. Refrigerant-113 and vapor charging techniques will be discussed in the industry's literature.

● There is a strong possibility that one or more azeotropes will be introduced in the next decade. These refrigerant mixtures will help solve some of the problems now encountered with the low temperature application of conventional refrigerants.

● Foam-in-place insulation will mushroom into equal importance with conventional insulation materials and techniques.

● Thermoelectric refrigeration will be encountered more frequently, although it will be far from common in normal applications. Two or three manufacturers will market small thermoelectric appliances at a cost which will compare with the original $100 per inch for the first 7-in. television sets.

● Freeze-drying will have made a measureable impact on food-storage. How much of an impact it's too early to say.

● Foreign developments, which are now 10 to 15 years behind ours, will leap frog into equality in some countries. Then the exchange of information will be two-way, and our refrigeration technology will, for the first time, import ideas and knowledge as well as export them.

SEE YOU IN 1970!

From the Files of the News

25 years ago . . .

Combination of a heating and cooling system, with a common duct system, will mean the sacrificing of the efficiency of one or the other, the Warm Air Heating & Air Conditioning Association was told by a consulting engineer, who said he was convinced that the two systems are "diametrical in general design, volume of air, location of inlets, controls, and many other items." . . . George Taubeneck, completing the first lap of his "Trip Around the World," reports from Los Angeles that "the most important fact here in the lives of electrical equipment merchandisers is the advent of the Boulder Dam Power."

The checking and determination of proper refrigerant charges in air-cooled systems, including an explanatory chart, were presented by L. K. Wright of ASRE. . . . Prof. E. Micheli writes from Milan, Italy, that he has finished translation of our MASTER SERVICE MANUAL, for use by Italian industry.

"Could you give me the name and address of the concern that has perfected and is manufacturing an air conditioning unit to be installed in the conventional pleasure automobile?" a reader inquired. Answer was: Carrier Engineering Corp. . . . President of Crosley Radio Corp. predicted to 700 industrial leaders a "dubious future" for television, with "how to entertain the public" its greatest problem.

First all-glass windowless structure to be air conditioned, the Owens-Illinois Glass Co. two-story glass block research laboratory, was completed in Toledo. The system was designed to handle 26,000 cfm of air, 12,000 cfm of which is fresh air for the virtually air-tight structure. . . . Use of liquid indicators in refrigerating systems was described by a Kerotest Mfg. Co. engineer.

10 years ago . . .

In light of the National Production Authority's copper order and other plans to cut use of essential materials by the consumer durable goods industry, air conditioning and refrigeration groups have programs underway to gain a "fair break" for industry on materials including the preparation of a booklet by the Air Conditioning & Refrigerating Machinery Assn. telling "in a graphic way the story of how many phases of our economy today are absolutely dependent upon mechanical refrigeration." . . . A list price of $229.95 has been placed on the Mitchell ½-hp room air conditioner.

"Newer than new" is what those who've seen the plans are saying about the proposed year-round air conditioning system for an addition to the Manufacturers Life Insurance Co. in Toronto that would employ panel cooling as well as heating. . . . A Long Island builder of air conditioned apartments has predicted that some day air conditioning will be part of the equipment supplied in apartments, just as ranges and refrigerators are presently.

Some of the conclusions projected at an American Society of Refrigerating Engineers symposium on heat pumps: the heat pump should be considered a year-round air conditioner; the heat pump should first achieve acceptance in the South and Southwest; for the next several years the heat pump for residences will remain a "semi-luxury" and will therefore continue to find its main market in commercial establishments; heat sources will be less from ground coils and more from outdoor air, but with well water continuing to predominate in localities where adequate ground water is found near the surface; mass production of the heat pump is still in the future, although at present at least 12 manufacturers are engaged in heat pump activity.

"No single theory will explain all the phenomena of electrostatic precipitation—it's still an art, not a science," the head of Pennsylvania State college's electrical engineering department told the annual ASHVE meeting. . . . Studies conducted at the U. of Illinois Research Residences indicated that most satisfactory comfort conditions were obtained with a perimeter heating system, although satisfactory conditions can be obtained with radiant ceiling panels (using forced warm air to heat the panels).

OFF THE CHEST

ARCHITECT WOODS GETS CREDIT FOR ENGINEERING

Southernair Co.
Durham, N. C.

Editor:

Your article in the Jan. 2 issue of AIR CONDITIONING, HEATING & REFRIGERATION NEWS covering the heat pump installation in the Aeronautical Electronics, Inc. plant in Raleigh has received wide and favorable notice in this area. We have been delighted with the comments directed our way.

However, we wish to disclaim credit for engineering this job. The engineering was very capably handled by Hugh Woods of the architectural firm of Holloway-Reeves of Raleigh. The installation was made in strict compliance with his plans and specifications.

We would very much appreciate your giving Mr. Woods credit for the engineering of this very excellent job in an early issue of the NEWS.

H. L. GODWIN,
Vice President

READER IN SCOTLAND FINDS AN ERROR

L. Sterne & Co., Ltd.
Glasgow, Scotland

Editor:

I have just recently been able to peruse fully your issue of Oct. 2 and I would point out an error in your article about Temperature scales on page 42.

According to my calculation, if the helium boiling point of 7.8°R is taken as equivalent to about -451°F., the remaining conversions are -268.3°C and 4.7°K. In point of fact, however, a direct conversion of 7.8°R to the Kelvin Scale gives 4.3°K, which is the temperature usually given for helium in Chemical Hand-books.

A. K. ALCOCK,
Technical Director
Hermetic Unit Division

'NEWS' ITEM BRINGS QUERIES FROM ALL U.S.

Portland General Electric Co.
Portland, Ore.

Editor:

As a result of your mentioning our 6-page booklet, "Basic Recommendations for a Satisfactory Heat Pump Installation," in your Nov. 21 issue, PGE has received requests for copies from all over the United States. This is certainly an indication of the far reaching scope of the NEWS.

BOB SEABERG,
Sales Engineer

From the leader in air-cooled condensing

the new KRAMER

UNICON-COMPRESSOR

PACKAGED *WATER-FREE* CONDENSING UNIT

3 *to* 70 TONS—HORIZONTAL *or* VERTICAL FACE

The low, slim-trim lines of the new Kramer air-cooled UNICON-COMPRESSOR give it unequaled flexibility in any architectural setting. Space saving outdoor design and low, low operating weight combine to reduce structural and engineering problems. Easy and economical to install, the complete packaged UNICON-COMPRESSOR has matchless accessibility for servicing. Its corrosion resistant aluminum casing, and its frame galvanized after fabrication, eliminate painting maintenance.

And remember—no place in the U. S. A. is too hot (or too cold) for the UNICON-COMPRESSOR. With the patented Kramer Winterstat it will operate any time of the year, without adjustment, even in the dead of winter.

Write for bulletin C460B.

KRAMER TRENTON CO., Trenton 5, N. J.

47 YEARS OF CONTINUOUS ACHIEVEMENT IN HEAT TRANSFER

SEE THE PROFIT FILTER LINE —BOOTH 869

FRAM AIR FILTERS FOR PERMACHEM-TREATED...AIR

HEATING AND COOLING GUARD QUALITY

BOOTH 869–15TH INTERNATIONAL HEATING AND AIR CONDITIONING EXPOSITION

The only filter line with profit protection policies for distributors and dealers—to put the profit back into the air filter business!

The only filter line with hospital-proved Permachem treatment to kill 99% of trapped germs—from the laboratories of the world's leading filter maker!

The only filter line with complete sales programs and merchandising aids!

The only filter line with powerful consumer and trade advertising to help you sell!

The only filter line with anchor-locked frames and depthmaze construction for superior operational characteristics!

The only filter line with Good Housekeeping guarantee!

The only filter line with Fram's exclusive money-back guarantee!

See this full profit line—or write today on your company letterhead for full information and brochure

FRAM AIRE CO. Henderson, N. C.
Division of Fram Corp., Providence 16, R. I.

Pricing Problem Complex

Strong Organization Vital to Profitable Contract Maintenance Service Business

*By L. L. Grant, President, Hill-York Service Corp., and General Service Manager, Hill-York Associates, Miami**

In the few short years that I have been associated with this industry, which is a life time, I have seen the service end of our business grow from what was considered a necessary evil and overhead to what is now an important part of our industry.

It not only pays its way but, in many ways, makes a profit equal to that realized from the sales of major equipment. The one thing that has done most to make this possible, is contract maintenance service.

*Talk delivered at RACCA National 1960 annual convention.

Some of the many advantages of maintenance contracts to the operation of a service department are:

Year-round income,

Less manpower turnover,

Major overhaul and repairs done in the off season,

Better mechanics due to year-round employment,

Equipment kept in better mechanical condition resulting in fewer emergency calls,

Planning work ahead and not having to handle it on an emergency basis,

Assigning men to work in specific territories, thereby cutting down the high cost of travel time.

But above all, the prime advantage is that it gives the service department a product to sell that has customer appeal and need, and not merely a service to sell by necessity when he is in trouble and has to call you anyway.

Strong Organization Vital to Success

A service department, or company, whichever the case may be, that is to handle contract maintenance must be necessarily well organized in order to handle this type of business profitably.

To outline the organization necessary, you need first of all a general manager who is a qualified businessman with an insight into our business.

Secondly, a service supervisor who is qualified as your best mechanic, and has the additional quality of a salesman, businessman, and diplomat. He is going to come into personal contact with your customers and will have the responsibility of selling your service at a profit, and at the same time seeing that they stay sold through continuous satisfaction. He must be capable of solving any mechanical problems that might arise in the field with the servicemen.

Next, you need a dispatcher to handle incoming service calls, schedule maintenance inspections, and dispatch work to the servicemen. This is an important job, as this person is in closer contact with the customer than any one else in the organization, and should be courteous and efficient in handling customer problems.

You need a clerk-typist to handle the flow of paper work necessary in keeping the record up to date, especially job cost records that need to be reviewed monthly by the management.

Last, but by no means least, you need a crew of capable, clean, smart, and cheerful servicemen that will keep the customer door open to future business. The serviceman and his truck are continuously seen by the public, and at little expense they can, and should be good advertising.

2 Types of Contracts

There are two types of maintenance contracts in general use by the industry today. One is the full coverage contract that covers labor and materials, and the other, a straight labor coverage where the contractor furnishes all labor and the customer pays for any material used as an extra to the contract.

Our own policy at Hill-York is that only the jobs installed by us, or our dealers, are eligible for the former, and competitive jobs are eligible for the latter. This does not necessarily have to be the case, but we feel that it adds a little strength to our sales department.

Pricing Problem Is Complex One

The problem of pricing maintenance is a very complex one, and there are no set rules that would hold true for the industry. The selling price would vary with:

The type of job,
Size of job,
Age of job,
Local labor rates,
Annual volume of business,
And a particular company's overhead.

Price is best determined by one's experience. I can, however, give you some averages as a rule of thumb guide in checking your own figures.

In our own operation, we have found that our overhead to productive labor ratio is one to one. For every dollar we spend for labor, we spend a like amount for overhead.

Our material to labor ratio is ¾ to 1, or for every dollar we spend for productive labor we spend 75 cents for material.

Bear in mind that this is strictly a service operation and certainly would not be true for other phases of our business.

One method of determining maintenance cost, or selling price, based on this information would be to determine the required labor, add 75% for material, 100% for overhead and whatever profit you feel you are entitled to, and you have an estimated selling price. Again I point out that these ratios are our own and yours may be different.

Another rule of thumb method for pricing air conditioning labor contracts in use in this area is $1 per ton per month on 20 tons and above and a minimum of $15 per month for package units under this size. But the best method of all and the one that we use is experience of past cost.

PERFECTION IN VERSATILITY

It's easy to match a Perfection air conditioner or heat pump to any installation requirement. Here, for example, is a Perfection remote air-cooled condensing unit and a full selection of indoor coils. The condenser can be installed in any outside location with an upflow, downflow or horizontal indoor coil selected to match the exact requirements of the installation. Horizontal and vertical air handlers are available, too, where added blower capacity is needed. Perfection Tri-Pak Remote Heat Pumps offer equally convenient versatility with indoor components that can be combined to provide any conceivable air flow pattern — to solve any installation problem. And Perfection Tuck-away units — both air conditioners and heat pumps — combine all components in a single compact cabinet for unprecedented ease of installation. Try Perfection for complete flexibility in 2, 3, 4 and 5-ton air conditioners and heat pumps. Your Perfection distributor will give you complete details. See him or write to us for his name. Perfection Division, Hupp Corporation, 1135 Ivanhoe Road, Cleveland 10, Ohio.

PERFECTION

"Be sure to visit our booth 1002 at 15th International Heating and Air Conditioning Exposition"

Water Shortage--

(Continued from Page 1)

the market which require water." More and more cities, of course, are calling for water conservation on large tonnage refrigeration and air conditioning installations. The casual use of "city water" seems doomed in light of the national report.

In addition to new water-consuming products, the governmental study shows that the growth of urban areas and the growth of industries which depend on water for processing have taken place so rapidly that it has been necessary for experts to telescope original prognostications that we wouldn't face a critical water shortage nationally until 1980.

Worsening Trend Accelerating

"The worsening trend in the water picture is accelerating," states the committee report. "In 1940 dependable supplies of fresh water in the United States exceeded the rate of use by 109 billion gallons a day. By 1950 this margin had dropped to 68 billion gallons a day.

"In 1960 the situation was reversed and the rate of use surpassed dependable supplies by 8 billion gallons a day." Daily use for 1960 is estimated to have been 323 billion gallons.

"The pattern discloses a likelihood that the United States will be the first highly civilized, technologically advanced nation to find itself in real difficulty due to freshwater shortages."

Adding to the problem is the trend toward increased pollution of fresh water by industry, by increased sewage dumping, by skyrocketing use of motor boats, by the discharge of detergents, insecticides, and other chemicals into water supplies "which then become unfit for reuse without treatment."

What Solutions Are In Sight?

That is the problem. What solutions are in sight?

"In the final analysis," the report continues, "it is almost certain that we shall have to depend on the seas, bays, inlets, and underground tables of brackish water for new sources of supply. Of course, this means converting saline water to fresh water by removing salts and other minerals from it."

Discussing the price of fresh water, the report estimates that the cost of water for municipal and residential uses averages 25 to 30 cents; water for industrial purposes varies in cost from 50 cents to $1.50—these averages for the cost per thousand gallons.

Pointing out that most of these costs are based on supply systems which are not of recent origin and which do not reflect current prices for equipment and delivery systems, the committee considers "Any conversion process which promises to operate initially at no more than $2 per thousand gallons is worth developing and refining."

Present conversion costs for sea water run between $1.25 and $2.25 per thousand gallons. Equivalent conversion costs for brackish water (one-third or less of the salinity of sea water) are 50 cents to $1.25.

The report lists these techniques for converting sea water:

Distillation — advanced techniques are prevalent and this method produces a product of great purity. High energy costs and deterioration of equipment are serious problems.

Electrodialysis — works well with brackish water, and with improved membranes may be a potential sea water converter.

Freezing — may lend itself to low energy and equipment costs; prospects for sea water seem good pending further research. (Note: Carrier Corp., for example, working with the Dept. of Interior, has developed a direct freezing process and an experimental operation of 15,000 gallons per day.)

Ion Exchange — has the advantage of simplicity but may require the use of chemical agents in quantity; is considered promising especially for treating used water which has become impure in varying degree.

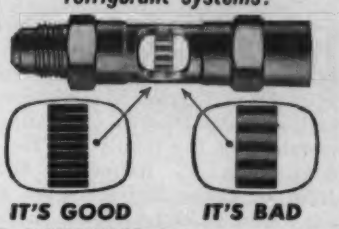
Hydrates — in earlier stages of research, but holds much promise from standpoint of low energy requirements and easy operating conditions. (Note: in hydration, a hydrocarbon such as propane will, at certain temperatures, combine with water in a saline solution to form a salt-free hydrate from which the water can be separated by a small change in temperature or pressure.)

Foreign activity in salt water conversion seems lagging behind ours, the committee concludes, probably because the need is not so great for them.

Japan, however, "an advanced technological nation, is now doing a good deal of work in salt water conversion. Initially this was not because Japan needed the water, but because it wanted the mineral by-products removed from the water. There are indications Japan will stay in the field possibly because it senses a coming market for conversion equipment."

Simplest, most economical way to detect moisture in your refrigerant systems!

Positive Sealing
LIQUID EYE® INDICATOR
featuring the built-in
MOISTURE-REACTOR



IT'S GOOD

The MOISTURE-REACTOR is composed of alternate, permanent and changing (Reactor) color bars. When all the bars appear the same color (green)—it's good—there's no moisture in system.

IT'S BAD

If moisture enters the system, every other color bar changes from green to yellow—then it's bad—the dehydrator should be replaced. When the system is moisture-free again, the Reactor color bars will change back to their original solid green color.

No more guesswork about the condition of your F-12 and F-22 refrigerant systems. No installation problems either.

Now you can get both in the same unit ...LOWEST COST MOISTURE REACTOR PROTECTION PLUS ALL THE PROVED LIQUID EYE FEATURES!

CONTACT YOUR WHOLESALER TODAY

Allin ALLIN MANUFACTURING CO.
410 NORTH HERMITAGE AVE. • CHICAGO 22, ILLINOIS

OVER 1,000,000 LIQUID EYES SOLD TO DATE!

Whether we fabricate our parts or buy them we still need H & H precision
Better Brass and Copper Products Since 1930
Even if you only buy the coils or straight lengths you need to fabricate your *own* parts – grain size, O.D.'s and wall thicknesses must be exactly as you want them if production is to move swiftly, smoothly and the quality of your completed product is to be maintained. So whether you *buy* the tubing, or have your parts *already fabricated*, the precision to be found in all H & H products is an ingredient you cannot afford to be without.
H & H TUBE AND MANUFACTURING CO.
271 North Forman Avenue, Detroit 17, Michigan • Offices from Coast to Coast
SEAMLESS
LOCKSEAM
COIL STRIP
STRAIGHT AND COILED TUBE
TUBULAR PARTS
PLANNED FOR PRECISION

The Contractor CAN Sell Quality

Couse 'Loses Interest' In Prospect Who Is Indifferent To Quality Story, But Reveals Profit To Those Who 'Buy' It

By Phil B. Redeker

WEST PALM BEACH, Fla.—As the firm which has installed air conditioning in the homes of many of the nation's business and political leaders (including members of the family of President John F. Kennedy) the John H. Couse Refrigeration & Air Conditioning, Inc. here might be expected to have some "different" approaches to the selling, engineering, and installing air conditioning equipment.

MULTIPLE-UNIT INSTALLATION, favored by Couse, is shown here in equipment room of installation serving the Palm Beach Biltmore dining room. Pictured are the 5-hp hermetic sections of 14 York air conditioners. Operation is through a Minneapolis-Honeywell 10-step control. First step starts the blower, the second step the condenser water pump and cooling tower, and the remaining steps, the hermetic sections.

It's true that the approach of the Couse Co. to the business of selling and installing air conditioning is different, but not just because many of the customers they are dealing with are millionaires (it is pointed out that such people are as hard, if not harder buyers, than John Public generally). What sets the Couse Co. apart from the majority of other air conditioning dealer contractors are the hard-and-fast principles upon which it conducts its business, and the way in which it engineers and installs its jobs.

John H. Couse has been an air conditioning and refrigeration contractor for 31 years. In this experience he has witnessed virtually the entire growth and history of air conditioning in the Palm Beach area. His principal lieutenant, as vice president of the company, is Frank M. Seay, a graduate engineer who, before joining Couse, counted among his experience a term as design engineer for one of the nation's leading consulting engineering firms specializing in the air conditioning field.

There are many areas of the Couse Co.'s operations which could be called "unusual" but the following describes those which are of principal interest:

Never Cuts the Profit

During the entire course of his business career in the air conditioning and refrigeration industry, Couse claims that he has never cut his established profit to get a job. What's more, all of the Couse Co. bids show the profit that the Couse Co. expects to make on any particular job.

In bidding on a job that runs to any size, the Couse Co. will prepare drawings in extensive detail, even though there is no assurance that a contract will be forthcoming.

Couse will always recommend the kind of system that it considers best for a particular job. However, if the customer has strong ideas on how he wants the job done, and can't be dissuaded, Couse will go along with it and design and install the job to produce the best possible results under the conditions imposed by the customer.

The company's aim, in designing and installing a job, is not only to achieve the desired results in terms of creating a certain condition, but also to do it so that the people occupying the conditioned space "don't see, hear, or notice the air conditioning system."

The Couse Co. personnel who work on installations are considered by the company management to be "air conditioning and refrigeration specialists" and function mainly in directing the setting up of principal components, hooking up the system, and test-checking it before it goes into service.

The insistence on making a profit on any job is bound up in the personal conviction of Couse that without a fair profit on each job, the firm is losing ground, rather than moving ahead, and also that if no profit is made, there is no point in being in business.

The "spelling out" of the Couse Co. profit on the bid proposal also serves as something of a "red-flag test" of probable future relations with the client. If the prospect takes very strong objections to the profit which has been designated, negotiations will probably be dropped.

"In selling long-term satisfaction a properly engineered job with good, quality equipment is the only way to accomplish it," Couse likes to tell his customers. "There is no such thing as a 'steal' where good air conditioning is involved."

Telling 'Quality' Story

While there is no question but that its many years of business and the good reputation it has enjoyed are factors in selling a Couse Co. proposal to a prospect, Couse doesn't let it rest there. Some special approaches are used to "sell" both the company, and the "quality" story of its installations.

With respect to the latter, when Couse or one of his staff visit a prospect, even though it may be for a relatively small home air conditioning job, they carry only two sets of controls and other easily transportable

here's
HEATWAVE
IT'S NEW!
IT'S EXPANDED!
IT'S COMPLETE!
With a New "Profit-Plus" Program for you.
Now is the time for you to join the Heatwave program. You'll get more profits, PLUS a completely expanded, new line!

SW
SOUTHWEST MANUFACTURING COMPANY
AURORA, MISSOURI
A Subsid... of F. E. Myers & Bro. Co. of ...land, Ohio

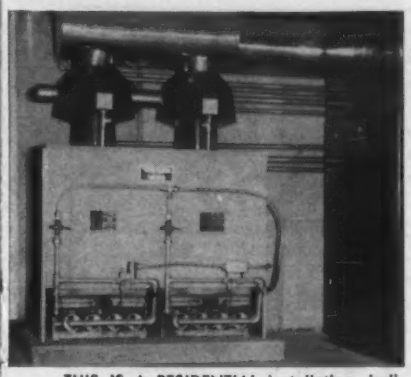
AIR CONDITIONING
Here's what will be new in the industry! You can start selling it now with this new line of remote and self-contained units. Look 'em over in 2,3,4,5,7½ and 10 ton capacities!

HEAT PUMPS
To meet the growing demand in this extra sales and profits market Southwest offers you 4 split systems and 2 new self-contained units!

FORCED AIR FURNACES
GAS AND OIL FIRED
You'll find an attractive Heatwave model for every installation sale. All have the famous Southwest "engineered quality," now expanded into the oil heating market too!

ELECTRIC FURNACES
SPECIAL AIR CONDITIONING FURNACES — WALL HEATERS ...AND THE MONEY MAKER FLOOR FURNACE
To complete the line Southwest gives you the new answer in the electric heating market! You'll get extra business with these wall heaters and floor furnaces too!

Regardless of your heating or air conditioning installation needs, residential or light-commercial, Heatwave now offers you the right model to sell the job! Make this season your "Profit-Plus" season. Contact: Vice President, Sales, Southwest Manufacturing Company, Aurora, Missouri.



THIS IS A RESIDENTIAL installation, indicative of some of the outstanding jobs done in the residential market by Couse. It is in the Jupiter Island residence of John B. Ford, Detroit industrialist. Equipment includes two York model 354 self-contained package air conditioners, and one York 1003 self-contained package, with heating by means of a gas-fired boiler, with hot water coils in each unit. In the 3-zone system one 5-hp unit serves the master bedroom, the other handles the servants' wing, and the 10-hp (twin 5's) handles the living room, dining room, and library areas.

components which will go into an air conditioning system. In telling the quality story, Couse hands the prospect a top quality component and a "price component" designed to do the same job, so that the customer himself gets the "feel" of the differences.

If the prospect doesn't readily recognize the advantages of the top quality equipment, and recognize what it will mean in terms of savings in maintenance costs and long-life of the job, the Couse man will generally write off the prospect as one who won't buy the kind of a system which Couse wants to sell.

If the prospect indicates that he is seriously interested in purchasing a good air conditioning system, the Couse organization will then set about to prepare quite detailed drawings of the proposed installation, and will draw up a complete bill of material and cost estimate.

"I realize that many contractors feel that we are letting ourselves in for a lot of unnecessary expense by preparing detailed drawings and setting up a complete cost estimate," says Vice President Frank Seay. "We find, however, that the detailed drawings serve to impress the customer with our ability and the thoroughness with which we go into a job, in addition to which many customers feel a certain 'moral obligation' to have us do the job because of the amount of time and effort we have taken in preparing such information. I would say that in close to nine out of ten instances in which we show the prospect such drawings, we get the job.

"And when a prospect sees our bill of material and cost estimate sheet and asks 'why are you so high?' it gives us the opportunity once more to tell the story of quality products and workmanship."

Proposal Has 'Sell'

The formal bid and specification proposal which the prospective purchaser gets includes, in addition to cost estimates and the standard sheets developed by York Div., Borg-Warner Corp. (for whom the Couse Co. is a distributor) covering work standards and performance and equipment guarantees, a list of prominent installations in residences, and commercial and industrial establishments. The occupants of residences which the Couse Co. has air conditioned include the names not only of U. S. citizens prominent in business and government, but also of some well-known foreign personalities.

Also bound into the loose-leaf formal bid proposal, which has an attractive hard paper cover, is a story with pictures about

DECOROUS INSTALLATION of styled cooling towers for residential installation shows what can be done to make such equipment "a conversation piece instead of an eyesore." Couse prefers use of individual cooling towers, especially designed and constructed to withstand effect of corrosive climate as well as for eye appeal.

the use of the multiple-unit type air conditioning system employing the York hermetic circuits. Titled "We Have the Answer" the story carries the byline of John Couse and outlines his viewpoints on why the multiple-unit system employing hermetics reduces first and operating costs and is "nerve relaxing" for both the user and the contractor.

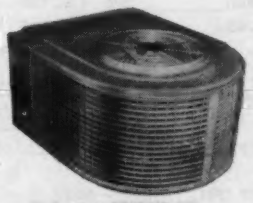
"We believe that the multiple-unit system has advantages generally, but we're certain that it has particular advantages in our market," says Seay.

"Our climate is such that constant humidity control is a requirement in every installation. This can be accomplished by the use of the re-heat method, or by step capacity control.

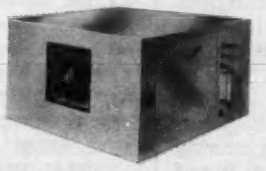
"We have found the step ca-

(Continued on next page)

EK SERIES REMOTE AIR COOLED CONDENSING UNIT. 2 through 10 Tons capacity ARI certified.



AK SERIES REMOTE AIR COOLED. 2 through 10 Tons. Distinctive Design for Extra Capacity.

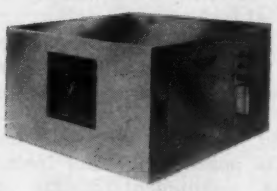


AIR HANDLER. 2 through 10 Tons Capacity for use with Condensing Units and Heat Pumps. Auxiliary Electric Heat Available.

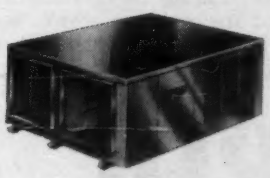
SELF-CONTAINED AIR CONDITIONER. 2 and 3 H.P. Completely assembled, pre-wired, pre-charged and tested at the factory.

EVAPORATORS. 2 through 10 Tons with or without cabinets for upflow, counterflow, or horizontal application.

PEK SERIES REMOTE CONDENSING UNIT. FOR USE WITH SPLIT-SYSTEM HEAT PUMP. 2 through 5 Tons.



PAH SERIES AIR HANDLER. FOR USE WITH PEK.

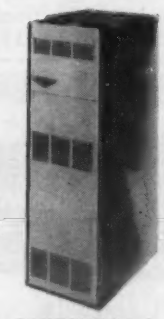


SELF-CONTAINED HEAT PUMP. 2 and 3 H.P. Hermetic Air-Cooled Unit for year 'round operation. Heating in winter—cooling in summer. Completely assembled, pre-wired, pre-charged and tested at the factory.

AIR HANDLER. 2 through 10 Tons Capacity for use with Condensing Units and Heat Pumps. Auxiliary Electric Heat Available.

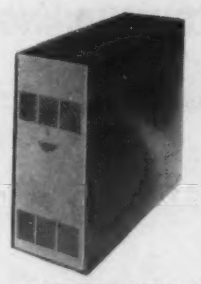
HI-LO FURNACE. 58 Series 75,000-125,000 BTU. IDEAL SIZE FOR CLOSET OR BASEMENT—only 53 inches tall.

HI-BOY GAS FURNACE. 56 Series 80,000-160,000 BTU. Highly Efficient. SIZED FOR AIR CONDITIONING.



COUNTER-FLO GAS FURNACE. 80,000-160,000 BTU. Hi-Style, full capacity. SIZED FOR AIR CONDITIONING.

HORIZONTAL GAS FURNACE. 60,000-120,000 BTU Our own design and manufacture. UNIQUE HEAT EXCHANGER does not burn out. SIZED FOR AIR CONDITIONING.

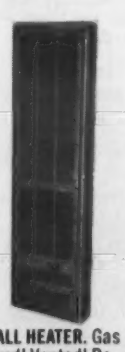


LO-BOY GAS FURNACE. Full Line, 80,000-200,000 BTU. Full Capacity. SIZED FOR AIR CONDITIONING.

OIL HI-BOY. 84,000-140,000 BTU. Hi-Boy, Horizontal, Counterflo. SIZED FOR AIR CONDITIONING.

ELECTRIC FURNACE. 63,000-126,000 BTU. Modular Construction permits use as Hi-Boy, CounterFlo, Horizontal, or Air Handler.

AIR CONDITIONING FURNACE. SERIES A. 75,000-125,000 BTU. BUILT-IN EVAPORATOR SPACE for 2 through 5 H.P.



WALL HEATER. Gas Fired! Vented! Recessed! AGA approved for Natural or LP Gas in dual wall (35,000-60,000 BTU) and single units (25,000-35,000 BTU).

FLOOR FURNACE. 35,000-75,000 BTU. All gases. Fifteen years proven quality.

Here's the line that's engineered to help you sell...with a minimum of service and a maximum of profit.

•

Visit Booths 608-610 at the ASHRAE Show

Bill of Material and Cost Estimate

Machinery and Equipment	List	Net
Compressors:		
Condensers:		
Cooling Towers:		
Pumps & Wells:		
Coils & Air Units:		
Blowers:		
Blower Motors:		
Contactors & Starters:		
Controls:		
Refrigeration Specialties:		
Grilles:		
Filter & Filter Racks:		
Insulation:		
Isolation:		
Freon Refrigerant:		
Freight: Cart. & Rigging:		
Erection Labor Compressor:		
Air Units:		
Condenser:		
Blowers:		
Refrigerant Piping:		
Plumbing & Drains:		
Electrical Work:		
Duct & Metal Work:		
Duct Insulation:		
Installation Supplies		
Foundations & Supports:		
Hangers:		
Test & Adjust Systems:		
Balance & Adjust Air. Dist.:		
Painting & Trimming Machinery:		
Cutting & Patching:		
Maintenance:		
Performance Bond:		
Insurance:		
Permits & Inspections:		
Total Cost of Machinery & Equipment Installed:		
% Florida Sales Tax:		
% For Ohd. Spvsn. Ins. Eng.		
% For Profit		
To Warranty Reserve Account	(Net)	
Quotation:		

THIS INFORMATION on the Bill of Material and Cost Estimate sheet is prepared by the Couse Co. as its own complete cost estimate on a job, and is also shown to the customer who thus is made aware not only of all the factors that make up the cost of the job, but also what the contractor's profit will be.

ELECTRIC PANEL BOARD for John B. Ford residence installation has each switch, starter, and relay identified with Seton name places. At far right is complete wiring diagram with plasticized cover, framed and mounted on the wall. In the center of panel board are three "normal drier" switches. These time clocks operate the system during the summer, when the house is closed, for dehumidification purposes only. Normal time clock operation is 8 a.m. to 10 a.m. and 2 p.m. to 4 p.m. each day.

(Continued from preceding page)

pacity reduction method generally preferable, although we may not use it in every installation. The multiple-unit system often provides other benefits in the form of reduced kw input and lower noise levels—also important with the kind of customer that we serve.

"Another factor is the fact that many of the people occupying air conditioned residences do not live in them during the summer months, yet it may be essential to the good maintenance of the furnishings and decorations in such homes to have humidity control in effect even though the homes aren't occupied. Here's another place where the multiple-unit system works to advantage."

Why Multiple-Unit Jobs

One of the prize multiple-unit installations to which Couse likes to refer is that for the dining room of the Palm Beach Biltmore hotel. For this area with a seating capacity of 800 people Couse installed a 76-ton system consisting of 14 "Yorkaire" sealed circuit units arranged in two banks of seven circuits each.

These units start and stop in pairs, providing seven steps of capacity control.

A single 10-hp pump supplies condensing water from a 3-hp forced draft cooling tower, while air distribution is by means of a 10-hp blower. Design conditions provide for 78° temperature and 55% rh when the outside temperatures are 93°F db and 80° wb.

This example does not mean that the multiple-unit type of installation is confined to large commercial applications. Couse believes firmly in applying it to residential systems (where the capacity requirements call for something more than a single small capacity unit), and in apartments. A recent Couse job consisted of the installation of individual 5-hp and 7½-hp packaged air conditioners for a 42-unit luxury cooperative apartment house.

However, Couse is not arbitrary about installing any certain type of system, and will, when a buyer insists, use all its resources to provide the best possible system. Perhaps the most classic example of this in the company's files is the installation made in the residence of one of the nation's most famed advertising executives. This man wanted the rooms in his home individually air conditioned, but not by window or through-the-walls units in the rooms.

So, the Couse Co. installed 12 York room air conditioners, totaling 12.7 tons capacity, each connected to ductwork and thus air conditioning the rooms individually. With each unit thermostatically controlled, and special pains taken to eliminate all noise and vibration with the use of special duct insulation, specially designed dampers, butterfly fasteners, etc., the total cost of the installation came to $18,000.

Design for Quiet

In developing its engineering and installation practices aimed at producing "quality" and trouble-free installations, particularly with reference to the special climatic conditions encountered, Couse Co. has come up with some approaches that are somewhat unusual.

Noise: In line with the concept of making the installation so that the customer won't "see, hear, or notice it" ductwork is sized so that the system can operate at minimum air velocities, around 400 fpm being preferred. Noise vibration elimination is carried out to the point that even in some residential installations, equipment rooms or equipment shelters are especially constructed, in some instances lined with Ultra-lite. Piping supports rest on cork imbedded in concrete.

Selection of Supply Grilles: Three considerations are involved in this: (1) the grille must have the characteristics that will provide for effective air distribution; (2) esthetic considerations are important, particularly in existing homes; (3) selection and installation of supply grilles should be such that there is no "streaking" of the area surrounding the grille.

For effectiveness, says Seay, the contractor prefers the use of high wall registers (6 in. from the ceiling if possible) with a fixed throw and of such a design to provide proper air

John H. Couse ✦ Refrigeration And Air Conditioning ✦ West Palm Beach, Florida

FINAL JOB TEST AND REPORT

JOB NAME:_____ DATE:_____ 195__ HOUR:_____ M
ADDRESS:_____ INSP. ENGINEER:_____

OUTDOOR D.B. TEMP.:_____ °F INDOOR D.B. TEMP.:_____ °F
OUTDOOR W.B. TEMP.:_____ °F INDOOR W.B. TEMP.:_____ °F
OUTDOOR R. H. :_____ % INDOOR R. H. :_____ % DEW POINT:_____ °F

BLOWER SECTION AND AIR BALANCE

BLOWER MOTOR H.P.:_____ M.P.AMPS.:_____ RUNNING AMPS.:_____
BLOWER MOTOR RPM:_____ BLOWER RPM:_____ BLOWER BELTS:( )
RETURN AIR CFM:_____ = AREA:_____ X VELOCITY FPM:_____
OUTDOOR AIR CFM:_____ = AREA:_____ X VELOCITY FPM:_____
SUPPLY AIR CFM:_____ = AREA:_____ X VELOCITY FPM:_____

REFRIGERATION SECTION

COMP. NO.	M.P. AMPS.	RUNNING AMPS. L-1	L-2	L-3	AIR ON EVAP FPM	AIR ON EVAP CFM	TEMP.AIR ON COIL	TEMP.AIR OFF COIL	TEMP.WATER OFF COND.
1									
2									
3									
4									
5									
6									
7									
8									

TEMP.AIR AT CLOSEST S.A. GRILLE:_____ °F AT FURTHEST S.A. GRILLE:_____ °F

PUMP AND COOLING TOWER SECTION

PUMP MOTOR H.P.:_____ M.P. AMPS.:_____ RUNNING AMPS.:_____
DISCHARGE PRES. AT PUMP:_____ psi SUCTION PRES. AT PUMP:_____ psi
GPM CONDENSER WATER ON TOWER:_____ PRES. AT CONDENSERS:_____ psi
AIR ON TOWER CFM:_____ = AREA:_____ X VELOCITY FPM:_____
D.B. TEMP. AIR ON TOWER:_____ °FDB W.B. TEMP. AIR ON TOWER:_____ °FWB
D.B. TEMP. AIR OFF TOWER:_____ °FDB W.B. TEMP. AIR OFF TOWER:_____ °FWB
TEMP. WATER ON TOWER:_____ °F TEMP. WATER IN TOWER BASIN:_____ °F
TOWER FAN #1 MOTOR H.P.:_____ M.P. AMPS.:_____ RUNNING AMPS.:_____
TOWER FAN #1 MOTOR RPM:_____ FAN #1 RPM:_____ FAN #1 BELTS:( )
TOWER FAN #2 MOTOR H.P.:_____ M.P. AMPS.:_____ RUNNING AMPS.:_____
TOWER FAN #2 MOTOR RPM:_____ FAN #2 RPM:_____ FAN #2 BELTS:( )

HEATING SECTION

AIR THRU HT. EXCHANGER CFM:_____ = AREA:_____ X VELOCITY FPM:_____
TEMP. AIR ON HT. EXCHANGER:_____ °FDB TEMP. AIR OFF HT. EXCHANGER:_____ °FDB
TEMP.AIR AT CLOSEST S.A. GRILLE:_____ °F AT FURTHEST S.A. GRILLE:_____ °F

COOLING TESTED WITH SYSTEM IN 100% CAPACITY SIGNED:_____
HEATING TESTED WITH SYSTEM IN 100% CAPACITY Inspection Engineer

FINAL JOB TEST AND REPORT as used by the Couse Co. reveals the detailed manner in which the company check out its installations before they are turned over to the purchaser as complete and ready to operate. These reports are filed carefully for reference any time that the job may need further attention.

ZONE CONTROL
headquarters...

INTERNATIONAL HEATING & AIR CONDITIONING EXPOSITION

Booths 624-628

for:

- PACKAGED BOILERS
- LONG-LENGTH BASEBOARD RADIATION
- MOTORIZED ZONE VALVES
- ELECTRIC BASEBOARD RADIATION
- PACKAGED ELECTRIC BOILERS
- ELECTRIC-HYDRONIC SYSTEMS
- SILENT AIRVEC COOLING

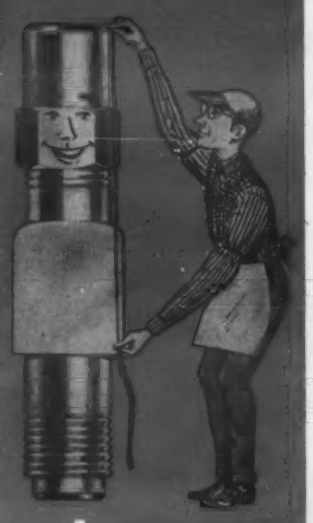
FREE: Visit our booth for complete Zone Control Design Handbook

Edwards ENGINEERING CORP.
Pompton Plains, New Jersey
TE 5-2808

PRIMORE VALVES can be "Tailor-Made" to suit your needs

We can Custom-Fit Primore Valves with these extras

¼" Flare with .040 Vent
Various types of Brackets
Hose Clamp Connection
¼" Flare with #100-AF Dill Valve Installed
Mounting Studs
Double Flare Connections



NOW AVAILABLE!
Cadmium or Electro-Tin Plating on Primore Valves. Provides excellent weather proofing.
CADMIUM plating on FLARED valves.
ELECTRO-TIN plating on SWEAT valves.

Whatever your valve problems, call us! Our Sales-Engineers can provide the answer.

Write for FREE Illustrated Catalog.

Primore Sales, inc.
2460 South Main Street • Adrian, Mich.

distribution with the lowest possible velocities. Proper design plus C.A.C. operation will cut stratifications and streaking to a minimum. So far as the esthetic factor is concerned, Seay says the objective should be, in existing homes, "to make the grille look like it had always been there." Part of the trick is to place it in some unobtrusive place, like over a door.

Controls: Preference here is not necessarily for the "fanciest" kind of control, but one that will insure operation of the system within the prescribed limits, and which almost above all, will have a long life. Some preferences in construction are for mercury type controls, and bronze bellows and sealed contacts.

Handling Corrosion

Protection Against Corrosion: "The only way to protect against corrosion in this climate is to virtually make your equipment selection and installation practices about the same as you would do for a shipboard installation," says Seay.

Pumps should be of the supersealed type. Vital metal working parts should be copper or bronze. Ordinary galvanized metal simply doesn't last. Couse metalizes all shells or cans with a liquid zinc, then adds three coats of a protective paint.

For controls in occupied spaces, Couse has a special plastic switch cover made to its own design, and also chrome plates the control knobs.

Many of the cooling towers which Couse installed were the Kennard model QT-5. In recent jobs the contractor has assembled some of its own, using a fiber glass cover and aluminum for the metal parts. Towers are also often installed with an aluminum louvered weatherproof pump housing.

Panel Board Details

Electric Control Panel Board: The panel board is installed in such a manner that it is isolated from the principal building construction, in order to eliminate as much as possible any malfunctioning of the controls because of vibration.

Each switch, starter, and relay is identified with Seton name plates. A wiring diagram drawn in complete detail is given a plasticized cover and framed and mounted on the wall near the panel board.

Fire Protection: Firestats set to close down the operation of the system when temperatures reach 200° are installed in all central systems.

Testing and Balancing: All systems are checked out and balanced with probably as complete a set of calibrated instruments as could be found in any contractor's establishment. Among the instruments used are recording thermometers, velometers, anemometers, and decibel meters.

The instruments are used in balancing the air distribution system "to be sure that we are getting the air movement we should where we should," as Seay puts it.

"We also check, and strive to eliminate, any 'shake, rattle, or roll' in any part of the system when it is operating," comments Seay.

Final Job Test and Report: On each job the Couse man making the final inspection signs a Final Job Test and Report sheet which (as illustrated) covers not only the conditions created by the system, but also the operation of the various elements such as the blower section, refrigeration section, heating section, and pump and cooling tower section.

Function of the Couse Co. Installation Crew: The installation personnel that are regular employes of the firm function primarily as supervisory and inspection personnel. Equipment is set in place by a transfer company, and much of the other work is contracted out. The Couse Co. personnel is on hand to see that the installation follows the engineering drawings, that valves and controls are correctly installed and proper connections made, to see that at the close of each day's work that any open pipe left on the job has a cap soldered on.

And of course they test out and balance the job when it is completed. Why this procedure in the use of its own employes?

"We think of the air conditioning and refrigeration installation man as a highly skilled specialist," explains Seay. "We don't want him doing things which we think are a waste of his skills, nor do we want to take a chance of sustaining an injury that might result in a loss of his skills for any length of time, or even permanently."

SOME OF THE INSTRUMENTS used in checking out the operation and balancing an installation are shown in the office of John H. Couse. They include everything from decibel meters, recording thermometers, velometers, and anemometers, to a Polaroid camera. The camera is used to take pictures before, during, and after an installation, to help in installation planning, and also to show the buyer the care taken in the installation procedures.

CONTRACTOR SAYS:

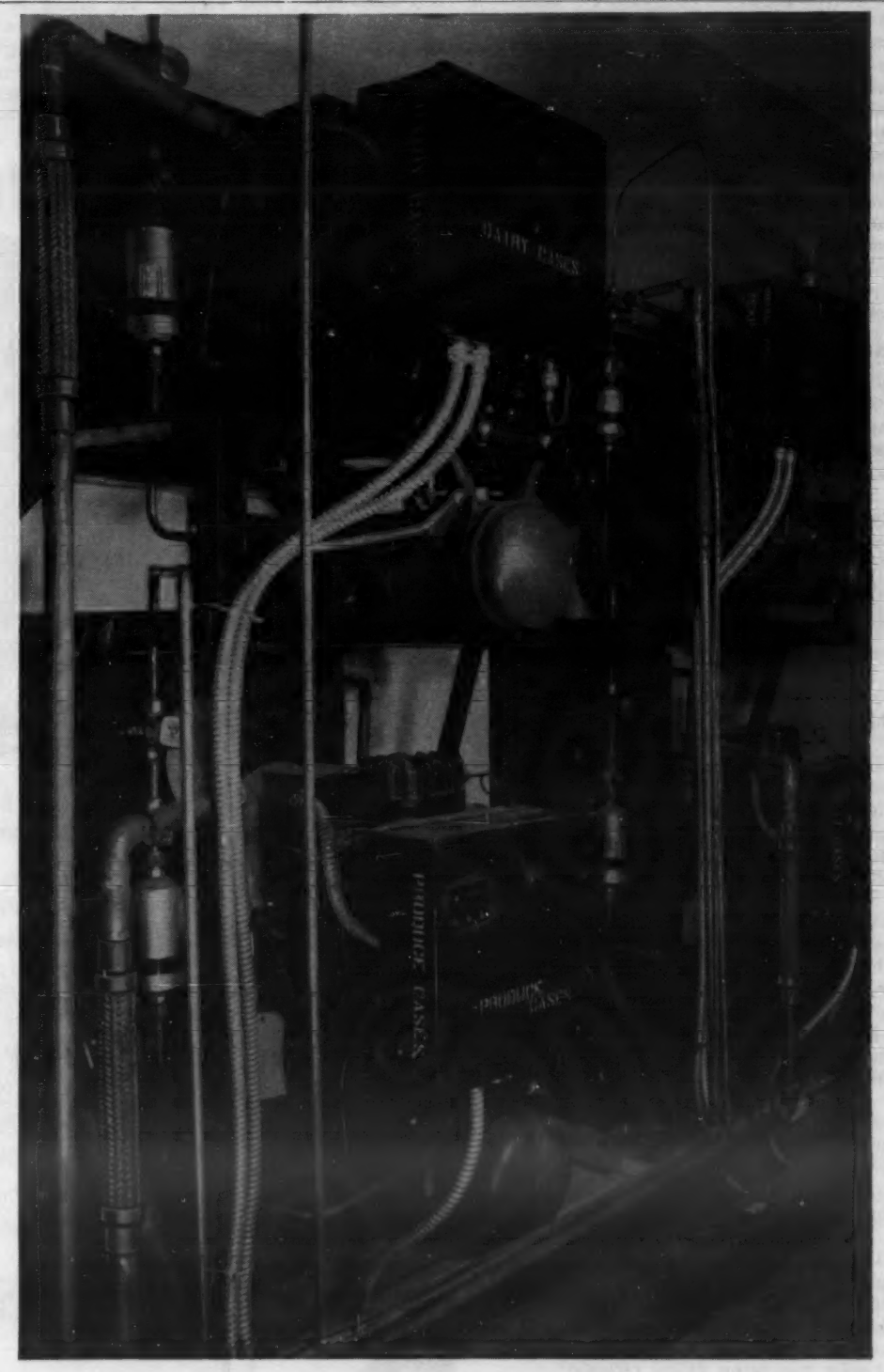
"Using Anaconda VE's is part of doing the job right the first time"

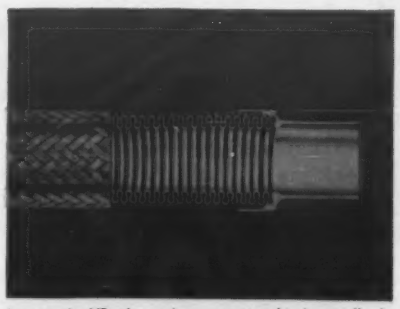
"With us it's the old story of doing it right the first time," says M. Celli of Bridgeport Fixture Company, refrigeration contractor of Bridgeport, Conn. "Part of doing it right involves choosing the most dependable parts. Over the years we've found that using Anaconda VE's is part of doing it right the first time."

OWNER SAYS:

"We're customer-minded right down to choosing equipment that will keep working for them. That's why we were satisfied when the contractor used Anaconda VE's when we rebuilt," says Tofie George, President of George's Market, Watertown, Conn.

A section of the compressor units for the refrigeration system at George's Market in Watertown, Conn., which was recently rebuilt and modernized. Anaconda Vibration Eliminators were used throughout to dampen and absorb destructive vibration. ▶





Anaconda VE, the only connector having a flexible core of seamless tin-bronze and special high-tensile bronze wire braiding—for longest service in dampening vibration in piping.

Quality Anaconda VE's are dependable. The tin-bronze flexible core and wire braiding give Anaconda VE's the tensile and fatigue strength necessary to control harmful transfer of vibration for millions of cycles. They require no maintenance, and are available in standard lengths and diameters. Anaconda VE's are stocked by leading wholesale distributors. VE's are recognized by Underwriters' Laboratories, Inc., under File SA 2585. For more information see your Anaconda Metal Hose representative, or write: Anaconda Metal Hose, P.O. Box 791, Waterbury 20, Conn. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario. G8156

ANACONDA® VIBRATION ELIMINATORS VE'S

Electric Heating, Year Round Equipment at Builders Show--

(Continued from Page 1)

claims will slash installation costs. Basic design lets the unit mount through a wall sleeve with the coil section resting on top of the furnace inside. Models are also available, however, to permit close-coupled mounting directly on the furnace instead of going through the wall. With the later installation connections must be provided for condenser air.

Off-Peak System Stores Heat for 12 Hours

A distinctly new approach to electric heating was represented in the off-peak electro-hydronic system introduced by Edwards Engineering. The company has devised an electrically heated version of its Zone-A-Matic boiler to be used with an insulated storage tank. The storage capacity must be enough to heat the house for 12 hours.

Some utilities are sufficiently interested in off-peak electric heating to offer special low rates which make this system economically attractive, the company claims.

Incorporate Electric Heat for First Time

Other new models incorporating electric heating on display for the first time included the following:

American Furnace: Intended for apartment houses or motels, two year-round models with remote condensing units are available with either gas or electric heat. Model APT-45 is rated at 45,000 Btu gas, 10 kw electric, and 16,000 Btu cooling. Model APT-70 is rated 70,000 Btu gas, 15 kw electric, and 22,000 cooling.

Coleman: Model 6805 is a complete electric furnace containing blower, filters, heating elements, and sequencer control providing a range of capacities in 5-kw increments up to 25 kw. Maximum rating is 93,300 Btu.

Fedders: Electric duct furnaces are designed to be attached to the company's "Flex-Hermetic" central air conditioning system. Three basic models offer two, three, and four stages of 5 kw heating. Range of the line is from 34,100 Btu to 68,300 Btu.

General Electric: Redesigned vertical air handlers in upflow or downflow models now have provision for addition of up to 20 kw electric heat. Range on cooling is 2½ to 6 tons.

Mueller Climatrol: "Electri-Module" unit consisting of a basic blower-filter section is offered with choice of three matching sections. Type 329 is an electric furnace section, the largest size being 24 kw (82,000 Btu). Type 339 houses indoor coil of remote heat pump in 2, 3, 4, and 5-ton capacities, while Type 939 has evaporator of remote air conditioner in same size range.

More New Heat Pumps

In addition to the new heat pumps already mentioned, the following were on display for the first time:

American Furnace: Models in 2 and 3-hp capacities are designed for either close-coupled or remote installations. Units are pre-charged, but if indoor and outdoor sections are more than 10 ft apart, refrigerant must be added. Up to three 5 kw resistance heaters are available for installation in discharge ductwork.

Coleman: "Polar Prince" heat pump is a split system 3-ton unit designated as Model 6208-701. Indoor section has one 5 kw element as standard with provision for two more if needed. Inside unit can be installed as upflow, downflow, or horizontal.

Delco Appliance Div.: As part of its "365 Conditionair" line, the company offers four sizes of self-contained heat pumps (2, 3, 4, and 5 tons) and two remote systems (3 and 5 tons). Four sizes of supplemental resistance heating sections are also available.

Perfection Div.: Remote heat pump introduced by Perfection is a 2-ton model featuring precharged refrigerant lines and factory wiring to simplify and reduce installation time and costs. With 22,000 Btu cooling capacity and 35,000 Btu heating (with auxiliary resistance elements) this Model PAR 20 heat pump is intended for the southern market.

As for straight air conditioning systems, there were some new or improved units shown besides those described above.

Carrier, for example, has provided a "Time-Guard" circuit in its outdoor Weathermaker section to minimize nuisance trip-outs and service calls in addition to protecting the compressor. A timer will not let the compressor start again for five minutes after it stops. When cooling is called for, the timer also turns on the condenser fan for 15 seconds before the compressor is allowed to start, thus cooling the coil and reducing system pressure.

Both remote and self-contained air conditioners are included in the new Delco Appliance line. Sizes are 2, 3, 4, and 5 tons in both types. For the remote line the company offers coil sections for use with furnaces or separate blower-coil sections.

Air Conditioning for Commercial Field

For the commercial air conditioning field Iron Fireman showed for the first time a year-round unit consisting of a General Electric "Thinline" room air conditioner combined with an Iron Fireman "SelecTemp" steam convector designed for use with small pipe low pressure steam systems. The air conditioner and convector sections can be independently serviced or removed from the wall cabinet.

Bow Self-Contained Through-the-Wall Air Conditioner

A self-contained through-the-wall air conditioner has been added by C. A. Olsen Mfg. Co. This is available in two models: PC-2 is rated at 2 tons, PC-3 at 3 tons.

While no basic changes have been made in the "Rangaire" line of Cobell Industries, both the self-contained and remote models feature some restyling.

One brand new product displayed by York Div. was its through-the-wall air conditioner recently described in the NEWS.

As part of its display of air conditioning units, Trane featured a cutaway of a new hermetic compressor to be used in its 5 and 7½-hp packaged equipment, both residential and

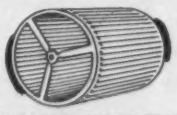
NEW AIR COOLER FEATURES

ICP

IMPROVED COOLING PERFORMANCE

GAFFERS & SATTLER IS THE NEWEST FOR 1961!

BIGGER COOLING PADS—20% thicker, special chemically treated aspen pads greatly increase cooling efficiency.

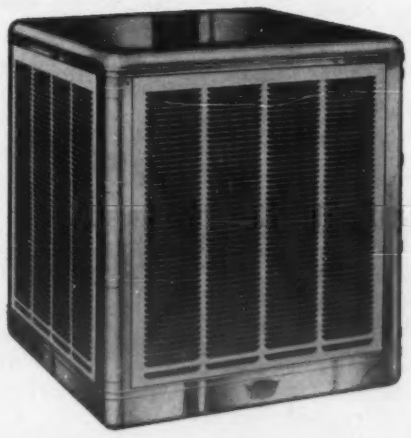


BIG SCOOP BLOWER WHEELS—Comparison proves that G&S wider, deeper blades move greater air volume.

MORE G&S QUALITY FEATURES for Increased Cooler Profits

Bottom and Side Discharge, Full-View Window Models, Residential and Commercial, 2000-16,000 CFM

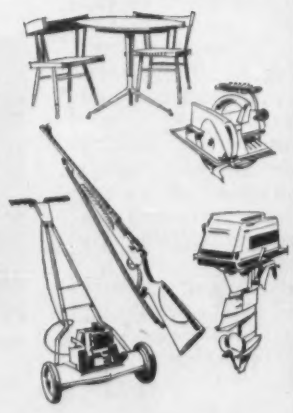
Heavy Gauge Galvanized Steel Cabinets • 2-Speed Controls • Uni-Flow Meters and Troughs • Water Minder • Screw Constructed • No-Sag Pad Rack • Bonderized Oversize Cabinets



NEW REASON TO BUY

TOP GUN

You'll want to throw a wide loop around the Top Gun program, pod'ner, and heat up your G&S brandin' iron. There's a corral full of excitin' gifts for you and the whole family when you sell Gaffers & Sattler air cooler—air conditioning brand. And gifts start with your first sale. So register for Top Gun today!



commercial. Called Model D, it's a short stroke, large bore machine running at 3,500 rpm.

A new residential type electronic air cleaner was displayed by Trion. Designated as Type UMT, it features a capacity selector which permits the installer to "dial in' a range of capacities from 80,000 to 200,000 Btu heating or up to 5 tons cooling. Over-all design is claimed to permit a 50% reduction in price.

Packaged Gas-Fired Boilers Introduced

Small packaged gas-fired boilers were introduced by the show by some manufacturers. The "O" series featured by National-U.S. is available in three sizes with input ratings of 75,000, 100,000, and 125,000 Btu. A. O. Smith was featuring its HW-80 boiler rated at 80,000 Btu input.

Bryant also has a new Model 230 gas-fired boiler, in addition to two new lines of gas furnaces designated as the 393 series and the 395 series. The 393 line is aimed at the mass new construction market.

Other new products in the heating field at the show included the following:

American-Standard: An oil-fired low-boy designed for basement installation offers adjustable legs as optional equipment. Five models give a capacity range of 84,000 to 140,000 Btu. In its GUB-GUA gas-fired furnace line, the company has increased blower capacity of the larger models to facilitate their use with summer cooling.

Notice of its entry into the electric heating field was also prominent in the American-Standard exhibit. Its new "Electri-Warm" line includes cable as well as baseboard, built-in, and portable electric heaters.

Armstrong Furnace announced the addition of larger capacity models to its 700 series of "high styled" gas-fired furnaces.

Among the products displayed by Lennox was its brand new 51,000 Btu gas furnace intended for apartments and small, well insulated homes. The unit is extremely compact, measuring 12½ in. wide.

A compact furnace of 90,000 Btu input was featured by Majestic. The new "Starline" series currently is available in both upflow and downflow models.

Wilbur F. Hurlburt, Sr. Dies of Heart Attack

SOUTH ORANGE, N. J. — Wilbur F. Hurlburt, Sr., 79, chairman and former president of Automatic Switch Co., Florham Park, died recently of a heart attack.

GAMA Reports 1960 Sales

Residential Gas Central Heating Sales at Second Highest Level In History

NEW YORK CITY — Unit sales of residential gas central heating equipment in 1960 were at the second highest level in the history of the gas industry, according to the Gas Appliance Manufacturers Association.

GAMA reported that the 1,174,000 furnaces, boilers, and conversion burners shipped during the year were exceeded only by the 1959 record-setting level. The 1960 total fell 13.5% short of the 1,327,262 units dispatched in 1959.

Factory shipments of furnaces, including forced warm air and gravity types, totaled 899,700 units for the year. The only year in which the manufacturers sold more furnaces was 1959, when 1,053,400 furnaces were sent to market. The 1960 volume was 14.6% less than the record.

Sales of boilers numbered 141,728 units in 1960, 4% less than the 147,662 record high compiled in 1959. The year just ended also was the second best for this equipment, GAMA said.

Conversion burners accounted for 132,600 units of the total. The year's sales volume for this equipment was 15.1% below the 156,200 burners dispatched in 1959.

The GAMA report, compiled through a monthly telegraphic survey of manufacturers, also showed that December shipments of furnaces, boilers, and conversion burners numbered 55,000, 6,877, and 6,900, respectively. These figures were 15.5, 6.9, and 11.5% below the December, 1959 levels of 65,100, 7,383, and 7,800.

The combined total for all types in December was 68,777, a decline of 14.3% from the 80,283 units dispatched in the same month of 1959.

The full year and December shipment figures for other types of gas heating equipment were as follows:

Vented recessed wall heaters—366,500 units were dispatched during the year and 28,400 in the month, marking declines of 18.5 and 22.4%, respectively, from the 449,500 and 36,600 units reported for the comparable periods of 1959.

Room heaters and other types of gas direct heating equipment—the 1960 total was 1,183,900, a drop of 18.1% below the 1959 level, 1,446,300. The December figures were 44,500 in 1960 and 63,600 in 1959, a dip of 30% for the final month of the year just ended.

Gas floor furnaces — December shipments of this equipment showed a sharp jump upward. The month's sales totaled 3,500 units, an increase of 20.7% over the 2,900 reported for the same month of 1959. The year's total, however, was 10.9% less than the 1959 level. The 1960 and 1959 totals were 86,700 and 97,300, respectively.

Gas unit heaters and duct furnaces — sales of this equipment, which is used in commercial and industrial installations, showed a 3.2% increase for the year. Unit shipments in 1960 set a new high record, 165,800, compared to the 160,700 dispatched in 1959, the previous high year. The December amount, 15,800, was 3.1% behind the 16,300 units shipped in the same month of 1959.

The GAMA report is based on a survey of manufacturers who account for a majority of the output in each category, with the responses expanded to show national shipment totals.

Conditioned Airport Terminal Opened

ASHEVILLE, N. C. — Asheville has opened its new, up-to-date, air conditioned airport.

Total cost of the project was two and one-half million dollars, half of which was paid by the City of Asheville and half by the U. S. government. It is located on an 830-acre tract about 12 miles from the city.

NEW AIR CONDITIONING CONCEPT

THUNDERBIRD WEATHERAMIC

It's here, the first and only practical, field tested solution for pre-cooling condensing coils during extreme heat periods. The hotter the temperature, the more efficient the cooler operates—actual cooler discharge temperatures will be from 25° to 30° less than ambient air. The G&S Thunderbird Weatheramic condensing unit combines the best of air conditioning and evaporative cooling to create an entirely new profitable market. Customers buy because they save three ways: 1. First cost; 2. Operating cost (up to 30% lower); 3. Trouble-free service.

AVAILABLE IN 2 AND 3 TON CAPACITIES

GAFFERS & SATTLER

Sell the Complete Line of PFL Air Conditioning Precharged for Fast installation at Less cost

Remote Units • Self-Contained Units • Heat Pumps (Field Tested)

GAFFERS & SATTLER UTILITY

FOR THE NAME OF YOUR NEAREST GAFFERS & SATTLER DISTRIBUTOR MAIL COUPON TODAY!

GAFFERS & SATTLER
8111 W. Beverly Blvd.
Los Angeles 48, California

I'd like to know more about G&S big profit products and programs for 1961.

☐ Please send literature and other information.
☐ Please have a Representative call.

Name_____
Firm_____
Address_____
City_____ Zone____ State_____

Vacuum Pump—Use and Care

PORTLAND, Ore. — "The small portable vacuum pump has found a real place in every shop called on to service refrigeration equipment, stated Joseph P. G. Davis, manager of the western regional office of Kinney Mfg. Div., New York Air Brake Co.

Speaking at the 23rd annual meeting of the Refrigeration Service Engineers Society, Davis emphasized that the vacuum pump is a precision tool and must be selected, applied, and maintained as such.

In selecting the pump, Davis stressed buying a "good piece of equipment." By this, he meant a rotary, oil-sealed, 2-stage, mechanical pump. It should include "gas ballast or vented exhaust." "Make sure that the pump you purchase can be serviced in the field," he stated.

"A high vacuum pump is required to create the pressure of 50 to 100 microns that is needed to do a capable evacuating and dehydrating job.

Two Vacuum Valves

"The pump should be arranged with two vacuum valves on the suction of the pump, with a gauge connection between the valves," he said. In this way, the condition of the pump and the oil can be determined by blanking-off the pump from the system, and reading the gauge. "You can check the dryness and tightness of the system by closing the bottom gauge and observing the gauge," he explained.

"A leak is indicated by a continuous rise in pressure.

"Moisture in the system will be indicated by a rise in pressure, but when equilibrium is reached gauge will stabilize."

In explaining the influence of connecting line size on net pumping speed of the system, Davis showed that "the 'speed of the pipe' varies at the fourth power of the diameter, and only directly as the length. Thus the diameter of your connecting piping effects conductance much more critically than the length."

Use Care with Joints

Davis stated that all threaded joints should be carefully made. If possible, all joints but the connection to the pump should be sweated joints. He used a chart to show that at a pressure of 50 microns a leak of only 0.27 cubic inch of air a minute will completely use up the capacity of a 3 cfm vacuum pump.

Davis brought out the importance of using the proper instrument to measure the vacuum obtained. He discussed the four most common types of vacuum gauges — the Bourdon type dial gauge, the closed end U-tube manometer, the McLeod gauge, and the thermocouple gauge.

The Bourdon type gauge used in refrigeration servicing is inexpensive and is useful in following the pump down from atmospheric pressure. However, he said, "it becomes unreliable at readings better than 29 in., which is equivalent to about 25,000 microns, and we are talking of evacuating to 50 to 100 microns.

U Tube Manometer

Davis considers the closed end U tube manometer for 35 to 40 dollars, "the minimum equipment for a refrigeration service engineer." It is accurate, and relatively inexpensive, but it must be handled with care. The U tube is made of glass and can be broken, and if handled improperly, air can get past the mercury and destroy the vacuum in the closed leg.

Davis opined that the McLeod gauge is not a suitable instrument for refrigeration servicing.

He explained the operation of the thermocouple gauge, stating that it is reasonably accurate in the 50 to 100 micron range. "It also gives immediate indication, on a blank-off test, when the pump sealing oil is contaminated, which is an advantage," he said.

He strongly recommends the use of the thermocouple gauge over the manometer unless the extra $60 to $70 definitely rules it out. "Probably its chief disadvantage is its price of $100."

"The first thing to do after receiving your new vacuum pump is to read the instructions carefully before running the equipment," emphasized Davis. In Kinney's factory repair facility the most common troubles with returned pumps are:

a. The brand new pump has been run without referring to the operating instructions and has popped a shaft seal.

b. The badly contaminated pump. "This is one of the first things we look for when a pump is returned."

c. The pump that has stood for a period of time with wet oil in it. Some major parts usually have to be replaced and the repair usually becomes major in character.

Milwaukee's first luxury co-operative apartment house is nearing completion. The $4 million, 14-story, 82-unit Newport Apartments have been built and decorated with the best possible materials and workmanship. The apartment units are sold at prices ranging from about $41,000 to $62,000, plus a yearly charge for services, maintenance, and taxes. Each apartment unit contains a series of high-pressure induction circulators which provide complete year-round climate control. The induction circulators are manufactured by Mueller Climatrol Div. for the Worthington Corp. Tom Giebel (l.), Mueller Climatrol's sales engineer for national accounts, with Carl Leinberger, construction superintendent of Pflugradt Co., the heating and ventilating contractor for the project. Leinberger is pointing to the valve cluster which helps provide accurate year-round climate control. A total of 435 Worthington Slimline model Induction Circulators were used in this project.

You Asked About It

Q. What is the formula for determining the "Temperature Humidity Index," which is more popularly referred to by its original name—the "Discomfort Index?"—E.A.T., Unley, South Australia.

A. As defined by the Weather Bureau of the United States Dept. of Commerce, the Discomfort Index is four tenths of the sum of the dry and wet bulb thermometer readings, plus 15, thus a D-I of 75 would be reached when the temperature is 75°F and the relative humidity is 100%; or when the temperature is 80° and the rh is 60%.

Proponents of the system indicate that in summer about 10% of the population will be uncomfortable even before the index reaches 70; when it passes 75, more than half will be uncomfortable, and at 79 everybody will be uncomfortable with many feeling miserable.

As the index rises above 80 the degree of discomfort increases sharply. When the index reaches 86 in office buildings in Washington, D. C. present government regulations permit supervisors to dismiss employes.

The name was changed officially from Discomfort Index as a result of pressure from chambers of commerce in several large cities.

When you tap a line . . .
Stop fumbling
with loose parts

Use a NEW Imperial
Hermetic Piercing Valve

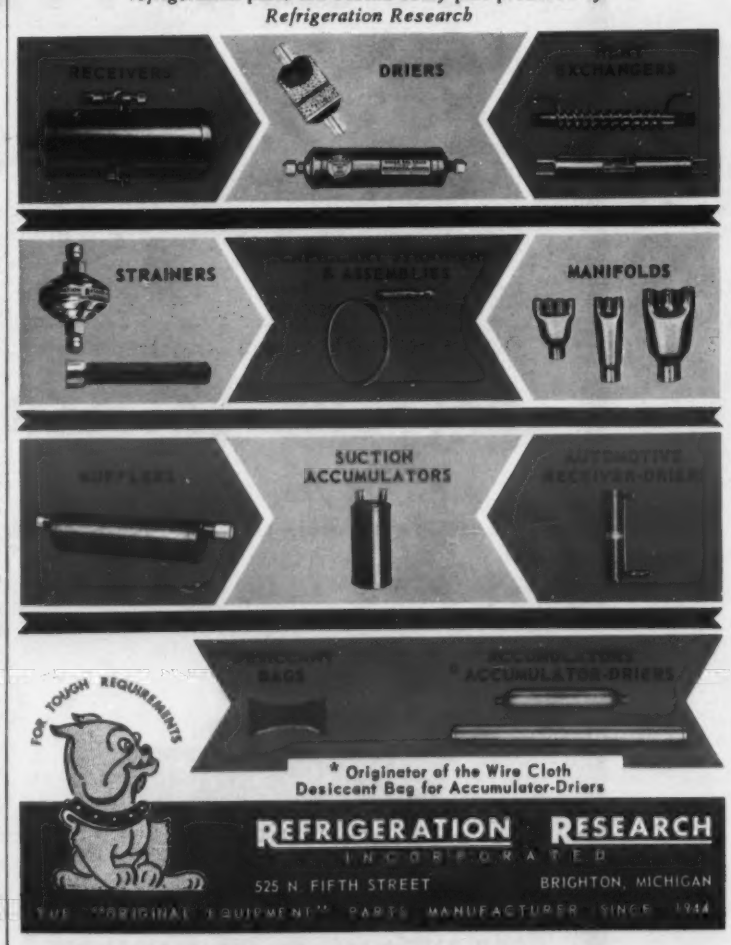
No loose parts. No bolts or screws required to adapt this unique C-clamp type piercing valve to a line. Just slip it over the tube, tighten nut, turn set-screw and pierce the tube. It's quick and economical. Tap the line at any point for charging, testing or purging hermetically sealed units. Handles: 3/16", 1/4", 5/16" and 3/8" O.D. Ask for Imperial No. 342-C Hermetic Piercing Valve.

SLIPS OVER TUBING

See us at ASHRAE Show
Booth No. N-228

IMPERIAL EASTMAN
Imperial-Eastman Corporation General Offices: 6300 West Howard Street, Chicago 48, Illinois

PRODUCTS OF
REFRIGERATION RESEARCH
ARE QUALITY PRODUCTS...ALWAYS
Years of experience in building quality refrigeration parts are behind every part produced by Refrigeration Research



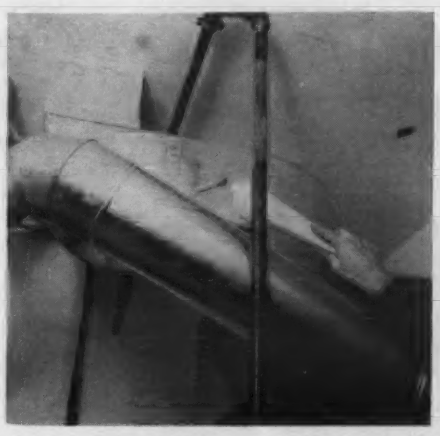
* Originator of the Wire Cloth Desiccant Bag for Accumulator-Driers

REFRIGERATION RESEARCH
INCORPORATED
525 N. FIFTH STREET BRIGHTON, MICHIGAN
THE "ORIGINAL EQUIPMENT" PARTS MANUFACTURER SINCE 1944

See the full product line of
REFRIGERATION RESEARCH
in Booth N-306

Project Homes Get 'Deluxe Heating Distribution'

"A HEATING distribution system in a project which would do justice to more expensive, deluxe jobs," is the description given by Ralph Benton, foreman for King Cole Heating Co., Detroit, of the warm air under-slab perimeter distribution system used in these houses in the Inkster Housing Project.



"WE DAMPER everything," says Ralph. "Each run has at least one damper."

CANVAS duct separators are another quality feature. Here Mueller Climatrol representative E. H. "Red" Saunders discusses it with Benton.

MUELLER CLIMATROL 131-150's are mounted on 4-in. concrete furnace bases, "still another quality feature," boasts the King Cole foreman.

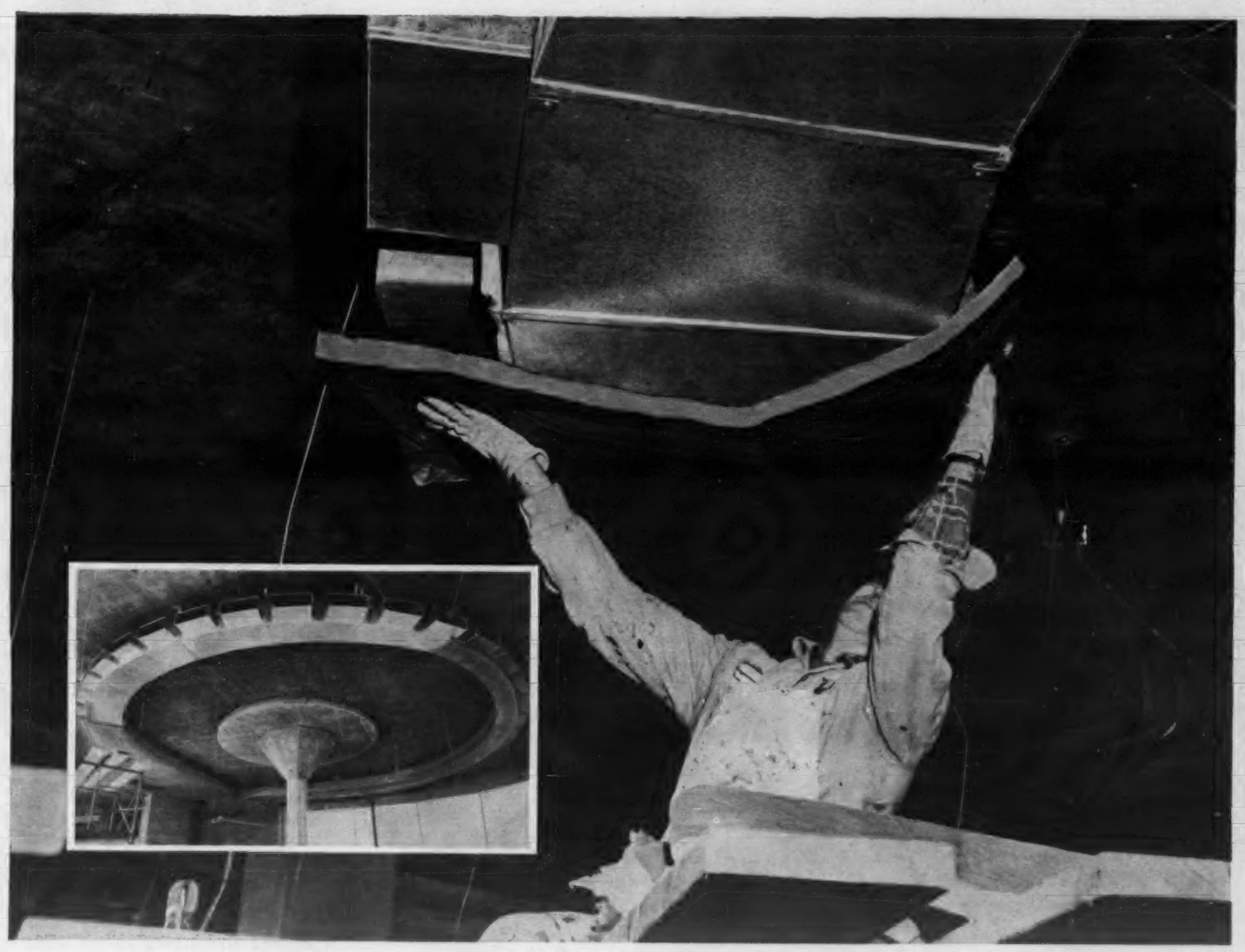
NWAHACA Short Course Enrollment Deadlines Near

CLEVELAND — Enrollment courses to be conducted in dates draw near for heating March at North Carolina State and air conditioning men interested in taking the short college, Raleigh, and Purdue university, Lafayette, Ind.

Scheduled dates for the classroom work at North Carolina are March 6-9. Featured subjects of this course, sponsored by NWAHACA, are:

1. Basic calculation and design of a heating system for a small residence.
2. Combination heating and cooling system for a larger residence.
3. Year-round system.

Purdue's short course, scheduled for March 13-16 has similar subjects scheduled for discussion.



Wrap up tough duct insulating jobs fast with ULTRALITE®

FOR INFORMATION AND DELIVERY CALL YOUR LOCAL ULTRALITE DISTRIBUTOR (LISTED IN ADJOINING COLUMN)

Unusually shaped duct systems, such as the one recently installed in the showroom of the Jerry Green Car Agency, Kansas City, Mo., are faster, easier, and more economical to insulate with ULTRALITE. Made exclusively of long, strong textile-type glass fibers, ULTRALITE is extremely lightweight and flexible, making it easy to wrap around oddly-shaped duct systems. What's more, its high resilience keeps ULTRALITE from compressing and losing its maximum thermal efficiency at the corners of the duct. Ease of handling makes ULTRALITE particularly desirable where working conditions are cramped or otherwise confining.

For high thermal efficiency, low installed costs and permanence, your best insulation buy is ULTRALITE. Write today for complete information.

GUSTIN-BACON Manufacturing Co. GUSTIN gb BACON

218 W. 10th St., Kansas City, Mo.

Thermal and acoustical glass fiber insulations . . . Molded glass fiber pipe insulation
Couplings and fittings for plain and grooved end pipe

G-B BLANKET INSULATION DISTRIBUTORS

AKRON, Ohio, The Asbestos Supply Co.
ALBANY, Ga., Industry Insulation Co.
ALBANY, N. Y., Hudson Valley Asbestos Corp.
ALBUQUERQUE, N. M., Mt. States Insulation Co.
AMARILLO, Tex., McDonald Engineering & Insulating Co.
Morrison Supply Co.
ATLANTA, Ga., Reynolds Aluminum Supply Co.
AUSTIN, Tex., Cinbar Engineering Co.
BALTIMORE, Md., Leroy Insulation Co.
BANGOR, Me., Eastern Glass Co.
BATON ROUGE, La., Eagle Asbestos & Packing Co.
BEAUMONT, Tex., Coburn Supply Co., Inc., Solar Supply Co.
BILLINGS, Mont., Big Horn Supply, Inc.
BIRMINGHAM, Ala., Reynolds Aluminum Supply Co.
Shook & Fletcher Supply Co.
BORGER, Tex., Western Chemical & Supply Co.
BOSTON, Mass., Homans-Kohler, Inc.
BRIDGEPORT, Conn., Robert A. Keasbey Co., Inc.
BRUNSWICK, Ga., Baker Bros., Inc.
BUFFALO, N. Y., Industrial Insulation Sales, Inc.
BURLINGTON, Vt., Pipe Insulators, Inc.
CHAMPAIGN, Ill., The Lewis-David Co.
CHARLESTON, S. C., Baker Bros., Inc.
CHARLESTON, W. Va., Asbestos & Insulating Co.
CHARLOTTE, N. C., D & B Insulation Co.
CHICAGO, Ill., E. C. Carlson Co., Calberg Asb. & Cork Co.
CHRISTOPHER, Ill., Hoe Supply Co.
CINCINNATI, Ohio, R. E. Kramig Co.
CLEVELAND, Ohio, Ohio Asbestos & Insulation Co.
COLUMBIA, S. C., Ind. Insulation Div. of Richland Oil Co.
COLUMBUS, Ohio, Santelar Brothers
Calberg of Ohio
CORPUS CHRISTI, Tex., Precision Insulation Co.
DALLAS, Tex., Acme Insul. & Sup. Co., Payne Ladewig, Inc.
DAVENPORT, Iowa, Republic Electric Co.
DAYTONA BEACH, Fla., B & F Insulation Co.
DECATUR, Ill., The Lewis-David Co.
DENVER, Colo., Plateau Sup. Co., Powers Ind. Insul., Inc.
DES MOINES, Iowa, Iowa Asbestos Company, Inc.
DETROIT, Mich., The Walter Rankin Co.
EL PASO, Tex., Insulation & Specialties, Inc.
M & M Refrigeration & Supply Co.
ERIE, Pa., Laco-McMullen Co.
EVANSVILLE, Ind., Geo. Kor's Sons, Inc.
FALCONER, N. Y., Laco Roofing
FT. SMITH, Ark., Gunn Distributing Co.
FT. WAYNE, Ind., M. H. Hilt, Inc.
FT. WORTH, Tex., Bracken Co.
GAINESVILLE, Fla., Baker Bros., Inc.
GRAND RAPIDS, Mich., M. S. Knee Co.
GREENSBORO, N. C., Starr Davis Co., Inc.
GULFPORT, Miss., Paine Supply Co.
HONOLULU, Hawaii, Parker Fallis Insulation Co., Inc.
HOUSTON, Tex., Precision Insulation Co.
INDIANAPOLIS, Ind., Lyon Lumber & Supply Co.
IRON MOUNTAIN, Mich., Champion, Inc.
JACKSON, Miss., Paine Refrigeration Supply Co.
JACKSONVILLE, Fla., Baker Bros., Inc., Eckles Dist., Inc.,
Forber Sheet Metal Works, Reynolds Alum. Sup. Co.
JOPLIN, Mo., Joplin Cement Co.
KANSAS CITY, Mo., Central Sup. Co., Kelly Asbestos Prod.
Insulation Acoustical Specialties Co., Inc.
KEWANEE, Ill., Mechanical Insulation Co., Inc.
LAKE CHARLES, La., Coburn Sup. Co., Inc., Solar Sup. Co.
LITTLE ROCK, Ark., Gunn Distributing Co.
LOS ANGELES, Calif., Accurate Insulation Co., Inc.
Western Fibrous Glass Products Co.
LOUISVILLE, Ky., General Insulation & Roofing Co.
LUBBOCK, Tex., Mechanical Equip. Co., Morrison Sup. Co.
MACON, Ga., Industry Insulation Co.
MARIETTA, Ohio, Asbestos & Insulating Co.
MEMPHIS, Tenn., J. A. Denie's Sons Co., Gibbons Sup. Co.
MIAMI, Fla., Reynolds Aluminum Supply Co.
Southern Metal Products Co.
MILWAUKEE, Wisc., F. R. Dengel Co.
MINNEAPOLIS, Minn., Asbestos Products, Inc
MOBILE, Ala., Shook & Fletcher Insulation Co.
MONTGOMERY, Ala., Shook & Fletcher Supply
MOORHEAD, Minn., Fargo-Moorhead Insulation Co.
NASHVILLE, Tenn., Reynolds Aluminum Supply Co.
NEWARK, N. J., Eastern Steam Specialty Co.
Robert A. Keasbey Co., Inc.
NEW ORLEANS, La., Eagle Asbestos & Packing Co.
NEW YORK, N. Y., Eastern Steam Specialty Co.
Robert A. Keasbey Co., Inc.
ODESSA, Tex., Morrison Supply Co.
Western Chemical & Supply Co.
OKLA. CITY, Okla., Ball Distributing & Engineering Co.
OMAHA, Nebr., Cardinal Supply & Mfg. Co.
ORANGE, Conn., Insulation Supply Co.
ORLANDO, Fla., Baker Bros., Inc.
PADUCAH, Ky., Triangle Insulation Co.
PHILADELPHIA, Pa., John F. Scanlan, Inc.
PHOENIX, Ariz., Williams Insulation Co.
PITTSBURGH, Pa., Dravo Corp., Keystone Div.
PORT ARTHUR, Tex., Coburn Supply Co.
PORTLAND, Me., Eastern Glass Co.
PORTLAND, Ore., Western Fibrous Glass Products Co.
RALEIGH, N. C., Reynolds Aluminum Supply Co.
RAPID CITY, S. D., Robbins & Stearns Wholesale
RICHMOND, Va., Reynolds Aluminum Supply Co.
ROANOKE, Va., C. E. Thurston Co.
ROCKFORD, Ill., Mott Brothers Co.
SALT LAKE CITY, Utah, Bullough Asbestos Sup. Co.
SAN ANTONIO, Tex., San Antonio Machine & Supply Co.
SAN DIEGO, Calif., Western Fibrous Glass Products Co.
SAN FRANCISCO, Calif., Western Fibrous Glass Prod. Co.
SAVANNAH, Ga., Baker Bros., Inc., Reynolds Alum. Sup. Co.
SEATTLE, Wash., The Brower Co.,
Western Fibrous Glass Prod. Co.
SHREVEPORT, La., Frith Sales Co.
SOMERVILLE, Mass., Insulation Products, Inc.
ST. LOUIS, Mo., Refrigeration Supplies, Inc.
The Stovey Company, Inc.
ST. PAUL, Minn., Asbestos Products, Inc.
SYRACUSE, N. Y., Burnett Process, Inc.
TALLAHASSEE, Fla., Baker Bros., Inc.
TAMPA, Fla., Eagle Roofing & Art Metal Works, Inc.
TULSA, Okla., Ball Distributing & Engr. Co.
TUPELO, Miss., Paine Supply Co.
VALDOSTA, Ga., Baker Bros., Inc.
WASHINGTON, D. C., Walter E. Campbell Co., Inc.
WAYCROSS, Ga., Baker Bros., Inc.
WEST PALM BEACH, Fla., Southern Metal Prod.
WICHITA, Kans., Wichita Sheet Metal, Inc.
1-16-61

Church Beauty Unmarred by Air Conditioning

WHERE'S THE AIR CONDITIONING grille through which the sanctuary of St. Joseph's Catholic church in New Orleans is cooled? Though it is in sight, you can't see it. It's over the door in the center of the picture, but painted black to match its surroundings.

BEHIND THE GRILLE is short duct to blower coil unit mounted over robe cabinet in sacristy. Thermostat for this unit and toggle switches to start and stop all units in the church are mounted at the end of robe cabinet.

INSPECTING THE 14 air-cooled condensing units beneath the church are (l. to r.) J. T. Knight, Jr., Equitable Equipment Co., Westinghouse distributor; Fr. Robert P. Miget, representing the Very Reverend Frederick A. Marsch, C.M., pastor of the church; and Lee R. Messina, president of Tulane Refrigeration Sales & Service Co., Inc., who designed and installed the system. Note how pipe supported beams shore up the floor where joists had to be cut.

By George M. Hanning

NEW ORLEANS — St. Joseph's Catholic church, largest in New Orleans and possibly in the South, was successfully air conditioned this past summer without marring the interior with ductwork and without mounting any equipment outside the church walls.

The church, a New Orleans landmark, is nearly 70 years old. Inside it measures 225 ft long and 100 ft wide. It will seat more than 2,000 worshippers. Height is 95 ft from floor to ceiling in the Nave. Center aisle is 12 ft wide and 150 ft long.

The air conditioning job was done by Tulane Refrigeration Sales & Service Co. with 88.3 tons of Westinghouse unitary equipment at an installed cost of only $37,000, according to Lee R. Messina, president of Tulane Refrigeration.

Only Plenums Show

Only ductwork to show in the interior of the church are six plenum boxes, two on either side of the six confessionals.

The equipment consisted of 14 7½-hp model AU-802-B air-cooled condensing units, and six model DXF-163 air handling units nominal 15-ton capacity each, and two model DXF-83 air handling units nominal 7½ tons each.

All of the condensing units, and the six DXF-163 air handling units were installed under the church. There is no indication of any machinery or components to be seen in the yard or anywhere outside of the church building, Messina said.

Return Under Pews

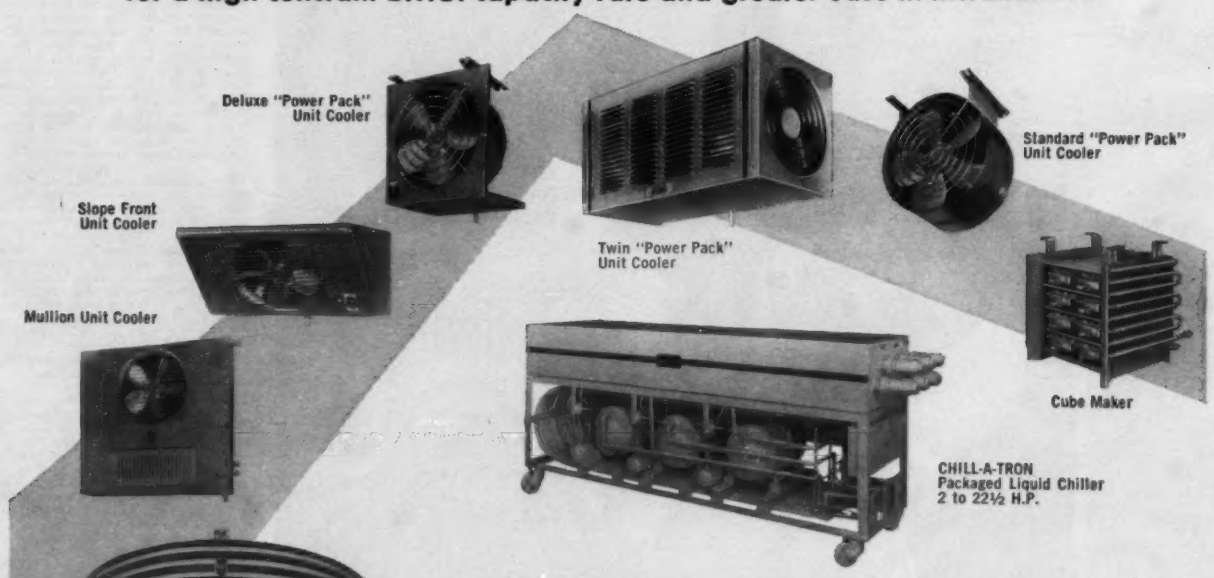
Return air grilles are under the pews, and lead through the floor to the air handling units. The supply ducts run up through the floor, through the laymen's sections of the confessional boxes, and terminate in the plenum boxes which discharge air into the conditioned area.

Krueger grilles were selected to throw the air (3,000 cfm each) to the middle of the center aisle. Air is thrown to a height of 14 ft and settles gradually without draft over the pews.

Air conditioning of the sanctuary was accomplished by the installation of a model DXF-83 cooling coil on top of the robe cabinets in the sacristy on each

There is BUILT-IN SATISFACTION in the COMPLETE PEERLESS Line

For every type of refrigeration application there is a Peerless Product. Many have exclusive features of design and construction responsible for a high constant B.T.U. capacity rate and greater ease in installation.


Deluxe "Power Pack" Unit Cooler
Standard "Power Pack" Unit Cooler
Slope Front Unit Cooler
Twin "Power Pack" Unit Cooler
Mullion Unit Cooler
Cube Maker
CHILL-A-TRON Packaged Liquid Chiller 2 to 22½ H.P.
Half Dome Unit Cooler
Flash Cooler and Fin Coils
Standard and Low Temperature Unit Cooler
"Universal-K" Evaporator and Condenser
CONCEAL-X for Hot and Chilled Water or Refrigerant

In Peerless you not only satisfy your customers' needs in coils, but you also give the extra advantages found only in Peerless Products, the result of 48 years' experience in manufacturing coils of all types together with exclusive features of design and construction. These features mean continuous satisfaction year after year because of a constant B.T.U. capacity rate.

The manufacturer or contractor who specifies and uses Peerless builds business on the firm foundation of customer satisfaction. At no other time in history has industry shown such a marked preference for Peerless air conditioning and refrigeration coils.

May we have the privilege of sending you catalogs and price lists?

MANUFACTURERS NOTE:
Send us blueprints of your evaporator and condenser requirements for quotation. Please indicate delivery requirements.

PEERLESS of AMERICA, Inc.

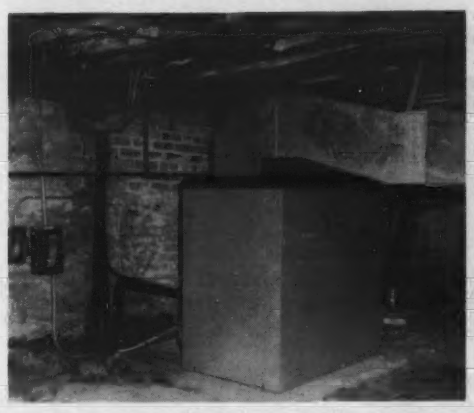
Manufacturers of Refrigeration and Air Conditioning Coils Since 1912

5800 N. Pulaski Road, Chicago 46, Ill.

side of the sanctuary, with the condensing unit below the church floor.

The control system for the air conditioning equipment is of simple design. It consists of thermostats placed ahead of the filters in the return air ducts, and a control panel with eight three-position toggle switches marked "Fan," "Off," and "Cool."

This control panel is in the sacristy where the priest can place in service any variation of air conditioning units that he may require according to the distribution of people in the church.



← ONE OF THE TWO condensing units serving the sanctuary. These are the only two not discharging to the outside. A piece of ductwork prevents short circuiting of air from discharge to intake of the unit.

→ NAVE OF THE CHURCH shows three confessionals along one wall. Atop each are two plenums and grilles throwing air toward the center of the 100-ft wide church. Three other similarly equipped confessionals are along the opposite wall.

Capacity Control

This control system permits a variety of capacity control. Any or all of the units may be placed in operation for cooling or for air circulation only.

Messina commented that he provided for only one air change per hour because of the high ceiling.

Design conditions, he said, were 95 and 80° db, 80 and 67° wb, with 50 to 52% rh.

The area beneath the church in which the condensing units and air handling units are located is only 5 ft high. Walls here are 3 to 4 ft thick, but are pierced by 15 openings on the sides.

Messina uses three of these openings to bring in fresh air and the other 12 to exhaust air from the condensing units directly to the outside.

Handling Air Exhaust

Only the two smaller units serving the sacristy and the sanctuary do not exhaust to the outside, but into the basement area. This presents no problem, he said, as there is 50,000 cu ft of space to draw from. A short piece of duct on the intake side, prevents air short circuiting.

Where it was necessary to cut joists to allow passage of ducts through the floor, heavy timber beams supported on pipe columns were installed to reinforce the floor.

Messina commented that the unusual type of heating system employed in the church forestalled any attempt at a combined heating and cooling system.

Steam Heat Used

The church is heated by 1-in. steam lines running under every third pew directly beneath the seats. Messina admired the system, which was installed when the church was built back in 1890. It puts the heat where it will do the most good and give most comfort to the parishioners without wasting heat in the church's wide open spaces.

Steam risers are insulated with horsehair, he noted.

Installing a unitary air conditioning system, besides offering considerably less initial cost than a central system, has definite advantages, Messina declared.

Biggest Unit 7 1/2-Hp

If any of the condensing units or air handling units should fail, the cost of repairs would be negligible compared with a large central system.

No compressor is larger than 7½ hp and the largest air handling motor is 3 hp. This facilitates obtaining promptly replacement parts generally available locally and thereby reducing shutdown time to a few hours.

While this is the first Catholic church that Messina has air conditioned, he is not a stranger to this type of application. On the contrary, he has installed air conditioning in 23 New Orleans churches during the past four years. Nineteen of these installations have been in Negro churches, he said.

Messina commented that 1960 has been his best air conditioning year since 1956. During the year, he sold 350 tons of equipment, all of it in the commercial field.

Thinking of—
- **changing territories**
- **expanding your territory**
- **taking on new lines—**

Check the
CLASSIFIED ADS
Your opportunity may be there.

THERMOSTATIC EXPANSION VALVES
AUTO. EXPANSION VALVES
WATER REG. VALVES
FILTERS AND DRIERS
PRESSURE REGULATING VALVES
SOLENOID VALVES FOR NONCORROSIVE REFRIGERANTS OR WATER
AUTOMOTIVE AIR CONDITIONING
DISTRIBUTORS
Over 300 Wholesalers
are now ready for your
replacement problems with
Dependable Controls
619 DEVICES for refrigeration and air conditioning control and their full specifications are organized for quick reference in the newest CC catalog. Only the basic models are illustrated on this page. You should have the whole catalog. Write for CC Catalog W-5-S today to the address below.
Visit Booth 903 at Heating and Air Conditioning Exposition, Chicago, Feb. 13-16, 1961.
Creative controls for industry
CONTROLS COMPANY OF AMERICA
HEATING AND AIR CONDITIONING DIVISION
2460 N. 32nd Street, Milwaukee 10, Wisconsin • Cooksville, Ontario • Zug, Switzerland
HAC-36-60

Adds Separators, Expansion Joints to Lines

● The addition of cast-iron steam and oil separators, sediment separators, and brass expansion joints to its established product line of high-pressure steel units has been announced by McAlear Mfg. Co., Dept. AH&RN, 1901 S. Western Ave., Chicago 8, Ill.

Available in both horizontal and vertical models, the low-pressure cast-iron steam and oil separators are designed for condensate or oil removal where maximum pressures are not in excess of 250 psi.

The units will supplement McAlear's present line of high-pressure steel separators, and are produced in sizes ranging from 1½ to 8 in., with a horizontal 125 psi model available in sizes from 1½ to 12 in. The 250 psi horizontal unit features a cast-iron drip pocket serving as a combination collector for both condensate and sediment.

The sediment separators are available in 125 and 250 psi units in sizes from ½ to 3 in., and feature narrow, in-line construction specifically designed for installation where space is critical in steam, water, air, oil, and other service lines.

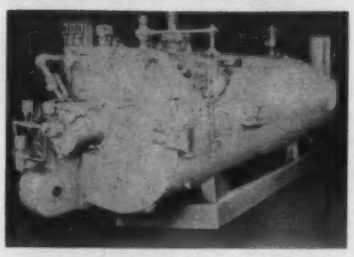
Brass screens with either .033 or .057-in. diameters are standard and optional.

Furnished in eight connecting pipe sizes from ½ through 3 in., the brass expansion joints are screwed, semi-guided types with standard traverse ranging from 2 to 2¾ in., depending upon joint sizes.

A special series with 6-in. traverse is available in sizes from ¾ to 2 in.

The expansion joints are designed for installation on steam or hot water heating lines, interior piping, hot water lines, or air, oil, or gas service applications. Maximum working pressures are 125 lbs for saturated steam; 200 lbs for cold water, oil, or gas, according to the company.

Automatic Firetube Boiler Has 'Unusual Design'



● Introduction of a new packaged automatic firetube boiler "of unusual design and outstanding performance" has been announced by Orr & Sembower, Dept. AH&RN, Reading, Pa.

"The new boiler is considerably changed in appearance from Orr & Sembower's previous models," it was pointed out. "Designated as the 'Powermaster Positive Flow' (model PF), it has burner and furnace located on the left side at the horizontal center line of the boiler. It is of three pass design with no tubes directly above or below the furnace, thus avoiding any impediment to the natural circulation flow."

"The circulation pattern is comparable to that in a watertube boiler," the company said. "It develops as relatively cool water is directed down through the third pass, following the normal downward movement of natural circulation to the bottom of the boiler, then rising through the second pass and around the furnace."

In addition to the positive circulation feature, Orr & Sembower engineers "found that the side located furnace provided other important benefits: It eliminates danger of heat damage due to stagnant water and sludge at the bottom of the boiler. It makes all fireside and waterside surfaces easy to inspect. It permits design of turn-around spaces to be simple and accessible, with positive sealing assured."

Other features of the new boiler: "Hinged front cover, with quick-opening fasteners, can be opened for access to heating surface in less than two minutes without disturbing burner, wiring, or piping; rear cover is divided for easier accessibility and maintenance; back construction is available with either standard dryback or optional wetback."

Orr & Sembower plans to begin production of the new boiler in five standard sizes: 50, 60, 70, 80, and 100 boiler horsepower, all sizes available in oil-fired, gas-fired, and combination-fired. Hot water and steam atomization models will also be available in all five sizes.

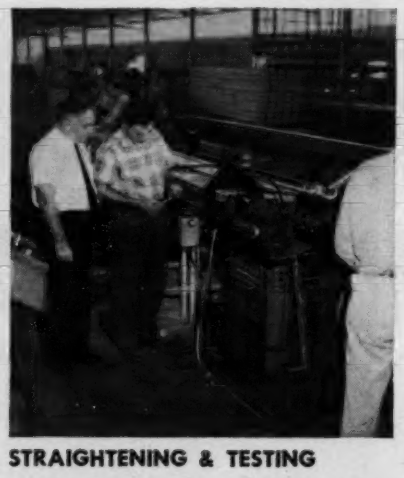
'Thred-Tape' Dispenser Needs Only One Hand

● An improved "snap-action, clean cutting, positive feed" dispenser for "Thred-Tape" pipe joint sealer has been announced by Crane Packing Co., Dept. AH&RN, (AN-8), 6400 Oakton St., Morton Grove, Ill.

The dispenser is a simple, convenient, and dirtproof device for handling the tape, the company said. It consists of a transparent plastic case upon which the chrome plated cutting and dispensing mechanism is mounted. The amount of tape still available is always visible.

"A knurled cylinder, conveniently mounted for thumb operation, feeds the tape through the cutter," it was explained. "When the desired amount of tape is exposed, light thumb pressure on the feed cylinder actuates a steel cutter with a ground and tempered knife edge to cut off the tape. The entire operation is performed with one hand, leaving the other free to wrap the tape around the pipe threads as it is being dispensed."

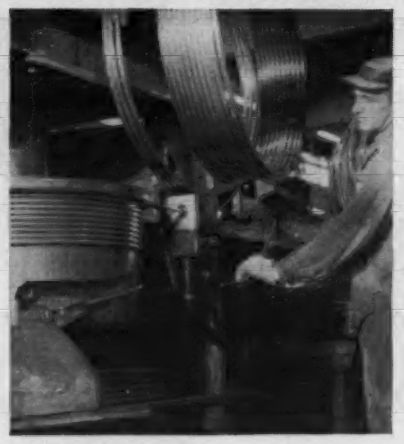
LANOLIN SPRAYING



STRAIGHTENING & TESTING

CUTTING & DEBURRING

COILING



BLOCK DRAWING

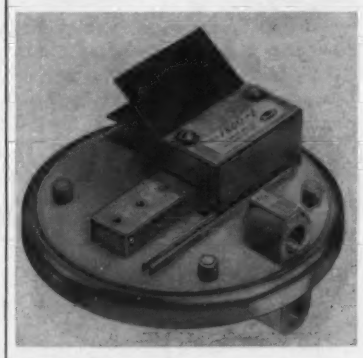
STEAM CLEANING

Mister METICULOUS

Kensico's friendly gremlin—Mister "M"—is an ace troubleshooter . . . competent coppersmith and craftsman . . . hard taskmaster. Under his watchful eye, Kensico technicians exercise the utmost care in producing air conditioning and refrigeration tube. Each order processed by this busy department is painstakingly filled to customer's exact specifications. Over the years, the spirit of Mr. "M" has brought us many new customers and friends. Want to meet Mister Meticulous? The line forms to the right. Next!

Kensico Tube
COMPANY DIVISION
Robinson Technical Products, Inc.
MOUNT KISCO, NEW YORK

Kensico Products are also available through Warehouse Distributors and Sales Representatives in Cambridge, Mass.; Middlebury, Conn.; Buffalo, N. Y.; Lindenhurst, N. Y.; Goshen, N. Y.; Roselle, N. J.; Philadelphia, Pa.; Flourtown, Pa.; Pittsburgh, Pa.; Cleveland, Ohio; Detroit Mich.; Chicago, Ill.; Evanston, Ill.; St. Louis, Mo.; Milwaukee, Wisc.; Durham, N. C.; Ft. Lauderdale, Fla.; St. Petersburg, Fla.; Dallas, Texas.



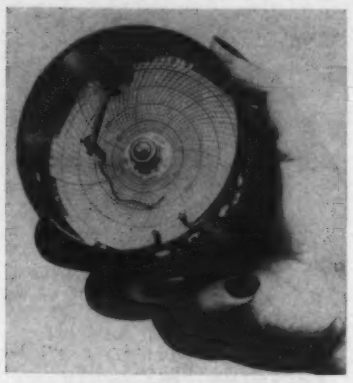
Differential Pressure Switch Available

● A new differential pressure switch, No. 1800 Series, is now available from F. W. Dwyer Mfg. Co., Dept. AH&RN (AG-8), P.O. Box 373, Michigan City, Ind.

"The switch is a low cost, compact unit (only 4 in. in diameter) of excellent sensitivity, operating from differential pressures as low as .15 in. water with ranges up to 80 in. water," the company stated. "It will hold a set point through various total pressures and can be operated from plus, minus or differential pressures in any position.

"The unit can be applied almost universally for accurate, low pressure sensing and control such as in cooling coil defrost control, dust collection systems, air filters, air curtain systems, etc. The new 1800 Series switch has very few moving parts, thus is virtually unaffected by severe vibration conditions, even near the actuation point."

What's New



Portable Recording Thermometer Offered

● A new portable recording thermometer is being supplied by the Airserco Mfg. Co., Dept. AH&RN, 435 Melwood St., Pittsburgh 13, Pa.

This instrument records temperature for seven days, without attention, on a 3⅝-in. diameter circular chart, according to the company. It features a dry stylus, moisture-proof chart paper, and an 8-day, spring-driven chart mechanism. The instrument is completely self-contained, in a black anodized aluminum housing.

The thermometer is completely supplied in four different "snap-on" temperature ranges: -20° to -220°F; -40° to -140°; -30° to -70°; -40° to -160°.

Combustion Supervision Provided by Gage

● "Hazegage" combination indicators are taking over the job of continuous, accurate, and reliable combustion supervision in all sizes and types of boilers, according to Photomation, Inc., Dept. AH&RN, 96 S. Washington Ave., Bergenfield, N. J.

"They are serving as smoke indicators as well as a dependable way to maintain maximum combustion efficiency," the company said.

"Red and green lights are included in the instrument panel board to notify the attendant of combustion conditions instantly and provide the information needed to make whatever adjustments or corrections are necessary. Every change in fuel or air adjustment or malfunctioning of furnace, burners, or controls is indicated immediately after it occurs so that there is no observation lag. Therefore a CO_2 sampling is unnecessary."

Looking for a Business to Buy . . . ?
Check the Business Opportunities Section in the classified advertising columns.

Make-Up Air Unit Mounts on Roof

● Model VR-2 "Sun-Flo" make-up air unit, in package form (one piece) to be mounted on the roofs of commercial and industrial buildings, is direct gas-fired and automatic in operation, according to Metals Engineering & Mfg. Co., Inc., Dept. AH&RN, 8824 Lyndon, Detroit 38, Mich.

These vertical units are made in nine different sizes with capacities ranging from 20,000 to 60,000 cfm. Btuh capacity ranges from 1,875,000 to 6,000,000, the company said.

Air intake is through louvers mounted atop the unit. Filter banks are optional equipment, with filters serviced through access doors from platform (also optional).

Automatic controls are mounted inboard, with ready access through a walk-in door. Automatic shut-down dampers are standard equipment. A remote control station is available with start and stop buttons and a summer-winter selector switch.

All Sun-Flo units are equipped with Maxon's series "H" Airflo burner and Airflo mixer, it was stated.

More details on the products described on these pages may be obtained by writing the manufacturer at the address given in each story.

Offer 'New Concept' In Electronic Air Cleaning

● A "new concept" in electronic air cleaning for homes or small commercial establishments —a unit that is "adaptable to a broad capacity range of central heating or cooling systems by simply turning a dial"—has been introduced by Trion, Inc., Dept. AH&RN, McKees Rocks, Pa.

The new Trion, called the model UMT (Utility Model Trion), offers unusual versatility through use of a "Capacity Selector," enabling this one unit to be used with heating systems ranging from 80,000 to 200,000 Btu capacity, or cooling systems of 2 to 5-ton capacity, the company indicated. The adjustment is accomplished by dialing the desired capacity on the Capacity Selector located on the power pack.

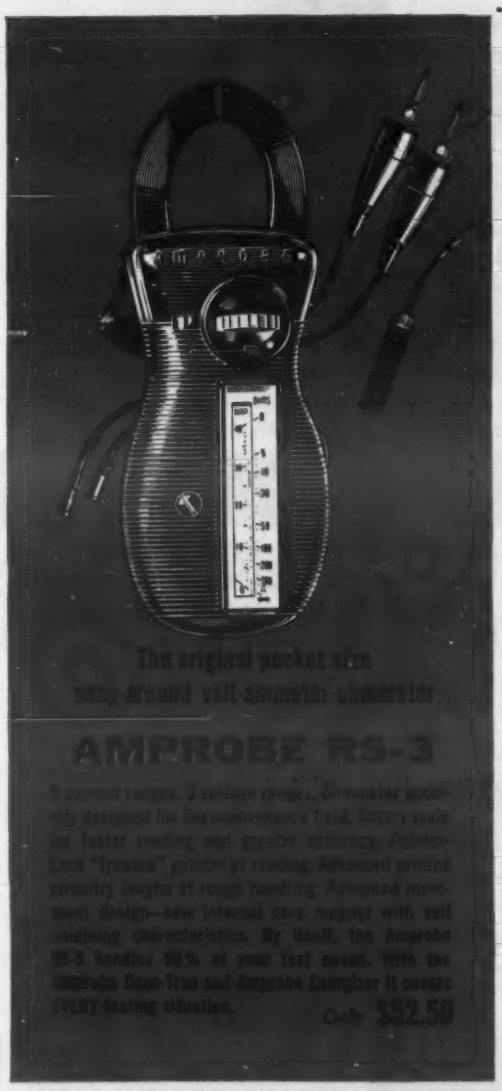
Model UMT has a built-in washer which is activated by turning a valve. The model may be floor mounted or suspended in the ductwork; it is adaptable to horizontal or vertical air flow requirements; and is interchangeable for either right or left hand installation.

The company said the UMT has an efficiency rating of 95%, as determined by the National Bureau of Standards' Dust-Spot Test Method. Suggested retail price of the unit is $275.

WORLD'S MOST WIDELY USED ELECTRICAL TEST INSTRUMENTS

AMPROBE®

THE ONLY LINE THAT COVERS ALL YOUR TESTING NEEDS



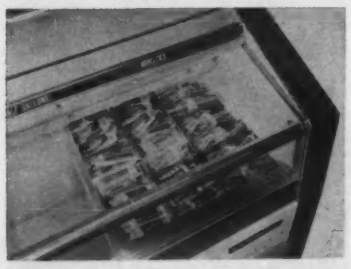
AMPROBE RS-1
The economy snap-around volt ammeter with many features of the great RS-3 including rotary scale, pointer lock, printed circuit, and advanced movement design. 4 current ranges. 2 voltage ranges.
Only **$39.85**

AMPROBE JR.
The advanced voltage tester that gives you current, too. Available in seven models, ranging from 10 amps to 100 amps in either 125/250 or 150/600 volts. Choose the model that fits your job. *Only* **$19.85**

AMPROBE TEST-MASTER KIT
Keep all your electrical-test tools right at hand with this rugged, genuine cowhide leather carrying case. The Amprobe **Test-Master Kit** contains either the RS-3 or RS-1, the Amprobe **Deca-Tran** (extends amperage readings 10x; as high as 1200 amps), the Amprobe **Energizer** (multiplies sensitivity of any Amprobe 10x for readings on small appliances and fractional h.p. motors), and a separate covered section to hold your small hand tools within easy reach.
Model TM-33 (with the RS-3): *Only* **$84.50**
Model TM-11 (with the RS-1): *Only* **$71.75**

PYRAMID INSTRUMENT CORPORATION, LYNBROOK, N. Y. WORLD'S LARGEST MANUFACTURER OF SNAP-AROUND VOLT-AMMETERS.

Novelty Bin Divider Introduced



● New Kelvinator novelty bin divider helps to increase sales because it displays novelties in an attractive, orderly array and eliminates paper cartons which clutter merchandising cabinets, according to Kelvinator Div., American-Motors Corp., Dept. AH&RN, 14250 Plymouth Rd., Detroit 32, Mich.

The divider accessory fits Kelvinator's merchandising cabinets, AMS-60, AMG-72, and AMG-84.

The novelty bins were first tested by Kelvinator in its booth during the dairy show in Chicago. Reaction was so favorable that the company decided to market the accessory, which sells for $10.50 per set of nine bins.

Offer Utility Vises For 'Rugged Use'

● A line of new untility vises "designed specifically for rugged use" has been introduced by the Wilton Tool Mfg. Co., Inc., Dept. AH&RN, 9525 Irving Park Rd., Schiller Park, Ill.

The "640 Line" consists of two sizes designated as No. 643½ and 645. The 643½ has a jaw width of 3½ in., a maximum opening of 4 in., and a jaw depth of 3 in. The pipe capacity ranges from ⅛ in. to 2 in. Shipping weight is 19 lbs.

The 645 has a jaw width of 5 in., a maximum opening of 5½ in., and a jaw depth of 3¾ in. The pipe capacity is ⅛ in. to 2½ in. The shipping weight is 34 lbs.

Adhesive Bonds Fibrous Glass to Sheet Metal

● The addition of a new adhesive—Permacel EZ-1910—to its line of materials for the heating, ventilating, and air conditioning trades, has been announced by Permacel, Dept. AH&RN, New Brunswick, N. J.

It is used for permanent bonding of fibrous glass insulation to warm or cold air sheet metal ducting. Both thermal insulation on the outside of duct surfaces and acoustical glass insulation on the interior of ducts can be adhered in place. Adhesive bonding prevents the insulation from bagging thus holding it tightly against the metal ductwork for better vapor barrier characteristics, the company said.

Permacel EZ-1910 can be applied by brush, roller, or spraying. It is a fast setting adhesive which allows bonding of the fibrous glass insulation one minute after adhesive application and will remain bondable for as long as 30 minutes after application, according to the company. Permacel EZ-1910 will bond to vapor barrier jackets of kraft paper, aluminum foil, or vinyl, and is also used to adhere to insulation facing flaps to the vapor barrier jacket.

Durable Tracing Paper Has Many Applications

● "Ozatrace," a new "fine quality" tracing vellum, has been introduced by the Ozalid Div. of General Aniline & Film Corp., Dept. AH&RN, Johnson City, 50 Corliss Lane, N. Y.

Ozatrace is reported to be the result of a new transparentizing resin "which has been matched with finest grade 100% unbleached rag paper. Ozatrace may be used as a highly durable tracing paper for engineering, tracing, architectural drawings, map reproductions, and for type-on masters for whiteprine, letterpress, or offset reproduction.

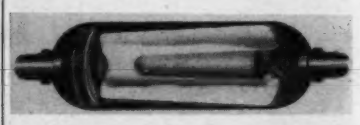
Remote Water Cooler Features Flexibility

● A new type of remote water cooling unit with a capacity of 5 gph features compact dimensions of 14 in. by 10½ in. by 6⅞ in., according to Sunroc Div. TT, Dept. AH&RN, Glen Riddle, Pa.

This Sunroc "Tiny Titan" is used to supply cold water to various types of drinking fountains. It "fits directly under the Sunroc stainless steel drinking fountains, and is easily connected to existing plumbing without alterations—in just minutes' time.

"The flexibility of the Tiny Titan makes it practical for new construction, and also for converting existing unrefrigerated fountains to cold water fountains. It is equally practical as a replacement cooler for other remote cooling units."

Service and maintenance are claimed to be minimized with this unit.



Drier Uses Solid Core Of Molecular Sieves

● A new dryer, available in sizes from 1 through 15 tons, has been announced by Kenmore Machine Products, Inc., Dept. AH&RN, Lyons, N. Y.

Eliminating plastics, fibre board, cotton, and other foreign materials from the inside of the drier and using a solid core of 100% molecular sieves without diluents, the KMP "Filter-Kore" drier gives "maximum protection to the system from acid and sludge after motor burnout," according to the company.

"The Filter-Kore drier delivers fine, selective filtration without powdering or channelling of refrigerant through the core. The drier is manufactured from noncorrosive materials compatible with refrigerants and oil."

Before sealing, reactivation is accomplished at 600°F and 500 micron vacuum, it was indicated.

When properly applied, the driers result in less than a 2 psi pressure drop, the company stated.

Add 3 New Water Heater Models to Line

● The addition of three new instantaneous gas multi-point water heater models to its line of automatic underfired gas and electric water heaters has been announced by Mor-Flo Heater Corp., Dept. AH&RN, 2176 East 76th St., Cleveland 3, Ohio.

In addition to being used for water heater requirements, the units have been designed as lightweight gas-fired boilers for hydronic installations. The new models and Btu input (natural gas) are: MF 225—64,200; MF 300—85,800; MF 350—100,200.

Among announced features are: automatic pilot and safety controls; all copper heat exchanger; for use with natural or propane gas; wall brackets included for normal installations.

See these fabulous new furnaces at the 15th International Heating and Air-Conditioning Exposition, Booth 6, International Amphitheatre, Chicago

Armstrong 100 series
up-flow, counterflow and basement models

- new high styling
- new high standards of performance
- new compact design
- same fine Armstrong quality

The complete Armstrong home comfort line includes the right gas or oil fired furnace and the right air-cooled air conditioner for every home — large or small . . . old or new.

ARMSTRONG FURNACE COMPANY
COLUMBUS A OHIO

851 West Third Ave. • Columbus 12, Ohio

'Climate Changer' Cuts Installation Time

● A new sprayed coil, draw-thru "Climate Changer"—engineered to reduce installation time and simplify maintenance—has been announced by The Trane Co., Dept. AH&RN, La Crosse, Wis.

Available in 14 horizontal and 13 vertical sizes, sprayed coil Climate Changers feature exclusive internal factory insulation for the entire unit including the tank section, according to Trane. Thus, the requirement for on-the-job tank insulating is eliminated, it was pointed out.

Spray pump and piping, including gate valve and pressure gauge, are also factory mounted to save installation time. Spray action, float operation, and the condition of the coils may be checked through unbreakable windows on both sides of the unit. Access is gained through strategically located, removable panels.

Wide angle nozzles, an exclusive S-shaped coil fin configuration, and an "anti-air by-pass" coil casing, make moisture eliminators unnecessary, Trane said.

New Contactors Said To Be More Compact

● Newly-designed 30 and 40 ampere contactors (CR153) and starters (CR154) have been added to General Electric's present line of air conditioning and refrigeration controls, it was announced by General Electric Co., Dept. AH&RN, Schenectady 5, N. Y.

The new units are smaller than former models of the same ratings, yet both forms handle up to 600 volts for compressor motor and special panel mounting applications, the company said.

General Electric engineers report savings of up to 19% with purchases of the most popular forms. "Operation costs are reduced since the new forms require only 4.5 watts—a reduction from 3.5 to 9.5 watts over previous forms," the announcement said.

"Construction features include dust resistant vertical contacts, optional push-on coil terminals, and three-point keyhole-mounted baseplate. Starters can be furnished with quick-trip or standard overload relays."

The 30-amp contactors and starters are rated at 30 amps at 220 volts, or 15 amps at 440/550 volts. The 40-amp forms are rated 40 amps at 220 volts, or 20 amps at 440/550 volts.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Develop 'Dip-Chek' Conductivity Meter

● The development of the "Dip-Chek" conductivity meter has been announced by Comroe Laboratories, Inc., Dept. AH&RN, 5208 South Lake Park Ave., Chicago 15, Ill., manufacturer of water demineralizing and allied equipment.

Designed specifically for the water treatment field, Dip-Chek fits the hand, weighs less than 5 oz., it was stated. According to the manufacturer, this direct reading instrument "permits immediate adjustment of chemical additives when needed.

"To meet regional requirements," the company said, "several scales are available ranging from 100 to 5,000 ppm as sodium chloride. Dip-Chek assures accurate readings within required limits for cooling tower systems. The instrument utilizes a new operating concept which inexpensively converts battery d.c. to a.c. eliminating polarization at the probe. Dip-Chek operates on two ordinary penlite batteries."

Want More Details?

ADDITIONAL details on products that are described on these pages may be obtained by writing the manufacturer at the address given in each What's New story.

Lightweight Flexible Tubing Developed

● A new type of lightweight flexible tubing has been developed for air conditioning and heating ductwork in aircraft by Flexible Tubing Corp., Dept. AH&RN, Guilford 2, Conn.

Called "Feather-Flex," the tubing has been installed in Sikorsky Aircraft's S-61L helicopter, said to be the world's largest amphibious helicopter.

"The significant weight reduction of Feather-Flex," the company said, "is possible because the tubing has a nylon helix rather than the coiled wire used previously. Used for either hot or cold air, the tubing has a temperature range of -40°F to 200°.

Introduce Economy Auto Conditioner

● The addition of a new economy model, the 1961 "Commuter," to its line of auto air conditioners has been announced by the Mark IV Div., John E. Mitchell Co., Inc., Dept. AH&RN, 3800 Commerce, Dallas 26, Texas.

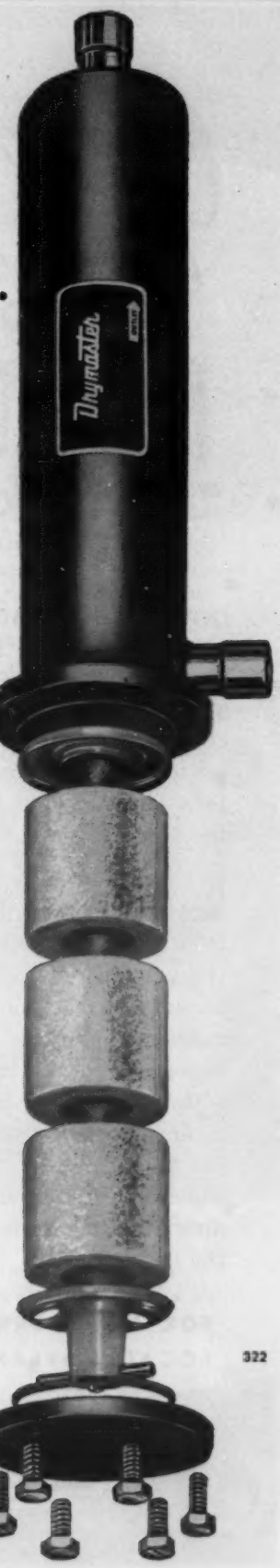
The Commuter is the same size as Mark IV's top-of-the-line "Monitor," the company pointed out. Its cost has been cut by—among other things—using the less expensive thermostatically controlled cycling clutch, instead of the Monitor's exclusive "Selectrol" temperature control, it was stated.

The insulated steel evaporator case has six rotatable black plastic louvers.

UNSURPASSED FILTERING AND DRYING with ADDED Convenience and Economy... It's the New Refillable Type Drymaster® Filter-Drier!

The superb, balanced filtering and drying performance of the new refillable type DRYMASTER comes from HI-FI Filter Block Desiccant: These fully activated, pressure molded briquettes quickly remove all harmful moisture, acid, sludge and micron-size foreign particles from the refrigeration system. HI-FI Filter Block Dessicant is non-dusting, non-channeling and is virtually unequalled in moisture adsorbing capacity. Its combination surface and internal depth filtering ability is unsurpassed by any other comparably sized drier in the field today.

And the new angle-type, refillable DRYMASTER Filter-Drier gives added convenience and economy, too. Once installed, the body shell of the Drier is in for the life of the system; only the desiccant is replaced. DRYMASTER Refillable Filter-Driers are designed for 5 ton through 165 ton capacities with ½" O.D. through 2⅛" O.D. solder connections. End fittings are made of copper for easier soldering.



HI-FI Desiccant Briquettes, protected against shock by fibre glass padding, come packed in vacuum sealed cans ready to be installed quickly, easily, with no connections or joints to remake.

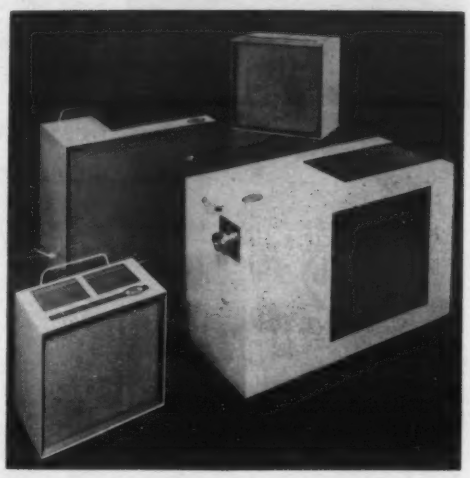
Write today for Catalog R-159 . . . contains complete information on all Streamline Refrigeration and Air-Conditioning products.

SEE YOU IN CHICAGO . . . BOOTH 845-849

MUELLER BRASS CO.
PORT HURON 13, MICHIGAN
VAMPCO ALUMINUM PRODUCTS, LTD., STRATHROY, ONTARIO
Exclusive Canadian Representative for Mueller Brass Co.
Air Conditioning and Refrigeration Products

322

Air Circulators Filter Germs, Odors from Hospitals



FOUR air circulators shown at right have been introduced by Fram Aire Corp. to trap and kill airborne germs and odors in hospitals and institutions. The filters are equipped with triple filters which, it is said, kill more than 99% of the germs trapped. Each has an air handling capacity large enough to "turn over" the volume of air in the recommended room size once every seven to ten minutes. Bottom left: The FAC 200A is recommended for rooms 12 by 14 by 8 ft. It has a two-speed switch which gives it an air handling capacity of 200 or 125 cfm, depending upon conditions. Suggested retail price is $69.95. Left: The FAC 350 has an air handling capacity of 350 cfm and is recommended for rooms 18 by 20 by 8 ft. It is a large machine best used in areas where airborne germ counts are critical due to infected patients. Suggested retail price is $119.95. Bottom: FAC 350 (Explosion-proof) is recommended for hospital operating pavilions and other areas requiring explosion-proof equipment. Its price to hospitals is $750. Top right: The FAC 125 is recommended for rooms 10 by 10 by 8 ft and retails at $49.95.

AGA Air Conditioning School

(Selected Random Notes of Interest to the Industry)

COLUMBUS, Ohio — Spend five days talking about gas air conditioning and you're bound to say something interesting and useful. That was the reaction of the participants who attended a five-day course sponsored by the American Gas Association recently.

From the lectures delivered in Columbus, the NEWS has selected random statements of general interest.

'SELL SMALL TONNAGE'

"The means to make more progress in gas air conditioning than in any other way is to sell small tonnage units—under 25 tons. In fact, if you start a program of selling 3 and 5-ton units, you will find that one-third of your sales will be going to commercial applications, whether you plan it that way or not. . . .

"One interesting point about these small tonnage commercial applications is that the utilization man can handle the installation; it's not like the big jobs where professional engineers are on the setup."—A. B. BANOWSKY, United Gas Corp., Houston.

'QUIET'

"A natural gas engine is quiet, not as quiet as a small electric motor, but definitely quieter than the refrigeration equipment it drives. . . . The natural gas engine can handle loads varying from 100% to 10% without cycling. Reduced speeds, with consequently reduced power input, reduces fuel consumption and provides humidity control. . . .

"A national mail order house in a large Texas city has operated two 120-ton gas-engine compressors without overhaul of the engines . . . only minor parts have been required—C. E. HARTWEIN, Laclede Gas Co., St. Louis.

"Insofar as (steam) turbine maintenance is concerned, it is very doubtful if any figure based on dollars per horsepower, dollars per hour, or any other method can be reliably established. The greatest variable and the most significant contributor to high maintenance costs is beyond the control of the turbine manufacturer. . . . This is the quality of the steam supplied to the turbine."—JOHN J. BOYLE, Worthington Corp.

'SERVICE IS REQUIRED'

"I have heard it said that one of the big advantages of an air-cooled condenser is that 'It requires practically no service or maintenance.' Don't you believe it. This is a piece of mechanical equipment and as such requires good scheduled maintenance.

"The only difference between this and other heat rejection devices is that of the time required effectively to maintain it." — VICTOR C. NELSON, Carrier Corp.

SELECTING FAN SYSTEMS FOR MULTI-FLOOR BLDGS.

"In a multi-story office building, space requirements and cost practically prohibit *one* central fan room. This may not be true as to fan rooms serving one or two floors or a few floors in a separate wing. . . .

"Peripheral systems are convenient for long narrow buildings where nearly all useable space is within 20 ft of windows. . . .

"Among peripheral systems, the induction type of units simplify the 'scattered' equipment and eliminate much wiring; fan-type units allow primary air to be delivered separately, where this is convenient. For high buildings, the over-all costs are often lower with induction units. . . .

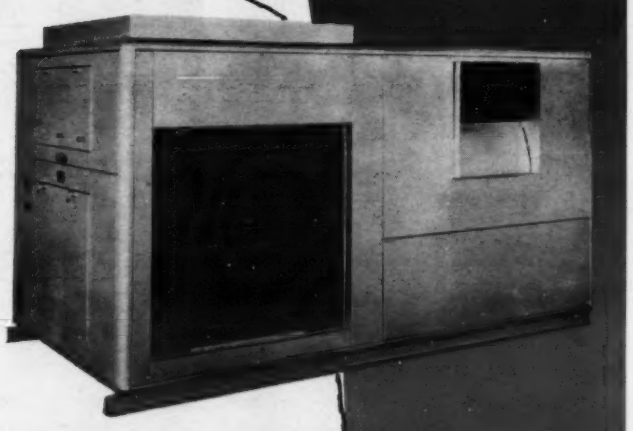
"Where large interior spaces are to be conditioned, horizontal duct systems are essential — unless the building layout will allow running vertical primary air ducts and secondary water piping. — ALFRED L. JAROS, JR., Jaros, Baum & Bolles, New York.

Engineer Shifted By Air Force

NORTON AIR FORCE BASE, Calif. — George E. Beard, who for the past eight years has been refrigeration engineer for Headquarters, Pacific Air Forces based in Hawaii, is being transferred to the Ballistic Missile Center here where he will be involved in low temperature applications for liquid oxygen facilities of Atlas and Titan launching sites.

"SATISFABRICATED" BY,
Governair
NEWEST ADDITION TO THE INDUSTRY'S LEADING SELF-CONTAINED LINE

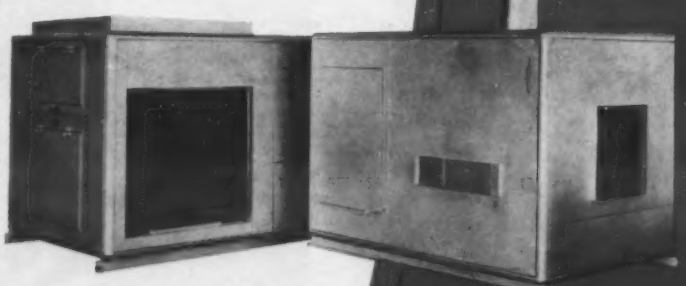
COMPLETELY SELF-CONTAINED
AIR COOLED
PACKAGE UNIT
TYPE SCAC



GOVERNAIR'S SCAC is available in six basic models from 10 through 40 ton capacities. Typical GOVERNAIR flexibility has been maintained with a choice of 4, 5, or 6 row cooling coils offered to meet all capacity requirements. Roof mounting has been considered in the Low-Silhouette arrangement.

The basic one-piece cooling unit is housed in a rugged weatherized cabinet and mounted on rails. It is completely wired, charged and tested at the factory. Demountable and remote arrangements are available, and accessories include choice of filters, face and by-pass dampers, reduced voltage starters, Low Ambient Control, and the Gas Fired Furnace Section.

YEAR-'ROUND AIR CONDITIONING is accomplished by the use of the gas-fired furnace section. This accessory consists of a complete and unaltered gas-fired duct furnace housed in a Weatherized Cabinet with an integral by-pass damper arrangement. Refrigerated air may completely by-pass the furnace, while any desired amount of air is diverted through the furnace during the heating cycle.



FOR AN INFORMATIVE FOLDER, CONTACT YOUR LOCAL GOVERNAIR REPRESENTATIVE OR WRITE

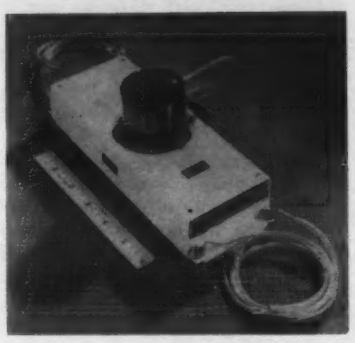
GOVERNAIR
4840 N. SEWELL
OKLAHOMA CITY

AiResearch Electronic Cooling Unit Uses Peltier Principle of Refrigeration

LOS ANGELES—A new type of electronic cooling unit, utilizing the Peltier principle of refrigeration, has been produced by The Garrett Corp.'s AiResearch Mfg. Div.

This electronic cooling package represents the first of a new line of cooling units to be developed by AiResearch, which has marketed heat transfer products for aircraft and missiles for over 20 years.

"The Peltier cooling device, utilizing only partial capability, dissipates 65.3 watts of heat to ambient air at 140° F. at sea level," AiResearch said. "In so doing, temperatures are maintained below 110° F. The Peltier modules require 20 amps, 5.5 volts d.c. power input of 110 watts for cooling.



NEW AiResearch Peltier cooling unit, utilizing only partial capability, can dissipate 65.3 watts of heat. It uses 64 thermoelectric couples to form a cooling plate.

"In operation, heat generated by gyro servo components is transferred via internal air and conduction to a stable platform aluminum housing.

"The AiResearch heat pump uses 64 thermoelectric couples which are formed into a cooling plate. They are attached to the stable platform housing. Heat in the housing is drawn out by the thermoelectric couples and vented overboard via an AiResearch fan through a plate and fin heat exchanger.

"The AiResearch fan has an air flow of 47 s.c.f.m. requiring 200 volts, 3 phase, 400 c.p.s.

Peltier Cooling Principle Described

"Peltier cooling uses electrons as an energy transport fluid. Basically, a d.c. potential is used to force electrons through dissimilar metal junctions. While the electrons are in one leg (or type of metal) they are at a given energy level.

"When the electrons move to another leg they pass to a different level of energy. If it is higher, the electrons must increase energy, if lower, they must decrease. In Peltier cooling they make up this difference by absorbing or rejecting this internal energy in the form of thermal energy, pumping it from the cool source to the hot sink.

Advantages of Using Peltier Principle

"Advantages of using the Peltier cooling unit include greater reliability, higher heat sink temperatures, and a capability of accurately maintaining a static temperature at one particular level."

AiResearch heat transfer project engineer A. L. Johnson stated that in addition to cooling, the unit, when coupled with an AiResearch temperature controller, can either heat or cool by simply reversing the current. Economically, he stated, Peltier cooling is less expensive than Freon systems in applications with a heat rejection rate below 400 watts and with a temperature differential of less than 50° C.

NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

Cost Reductions May Speed Thermoelectric Products

PHILADELPHIA—"It would seem reasonable to assume that if the present rate of progress continues, thermoelectric refrigeration will move into the appliance area sooner than had been expected."

This statement is part of an article by two members of Philco Corp.'s Advanced Development Dept. of the Appliance Div., appearing in the November issue of the *ASHRAE Journal*, monthly publication of the American Society of Heating, Refrigerating & Air-Conditioning Engineers.

Philco co-authors L. A. Staebler and P. F. Taylor base their predictions on anticipated cost-reductions by manufacturers of TE (Thermoelectric) materials, along with Philco advances in design and technology of thermoelectric systems.

These anticipated cost reductions will be realized when TE refrigeration products represent merely 1% of the current refrigerator production based on heat pumping capacity, it was stated. Philco advances revolve primarily around new design concepts, component miniaturization, and automatic manufacture.

Staebler and Taylor were co-authors with Donald Scofield of Philco in a preceding *ASHRAE Journal* article last July. That submittal forecast that thermoelectric refrigerating systems would be cheaper to build than mechanical systems within a two-year period — for applications up to 200 Btuh.

Now, contends Philco, accelerated progress has enlarged this two-year prediction to present reality for 300 Btuh capacities. At the same time, it is anticipated that increases in the figure of merit for TE materials should increase this to 500 Btuh within the next few years.

At the present time a two-door 12-cu ft mechanical automatic refrigerator requires 620 Btu for successful operation, it was noted.

Now possible are several novel applications of thermoelectricity to the consumer appliance field —and competitive with mechanical refrigeration. At the same time, Philco men say, TE offers features or capabilities not feasible with other systems.

The new forecast makes it appear that TE refrigeration products will invade the domestic market sooner than formerly thought probable.

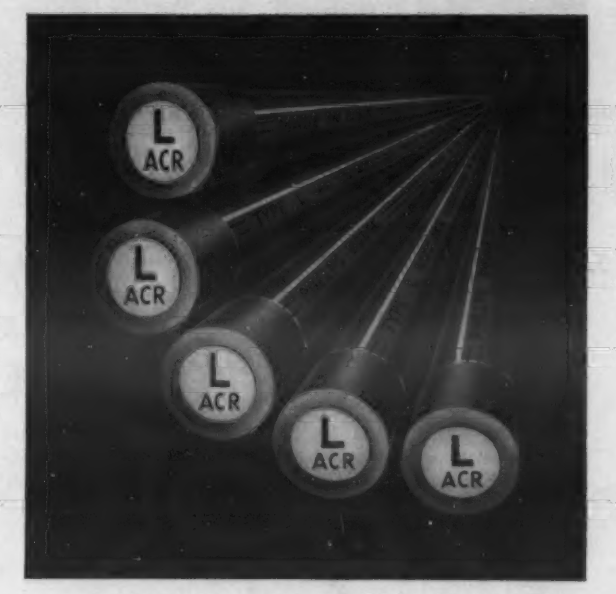
WHY YOU SHOULD SPECIFY

Phelps Dodge Copper Refrigeration Tube

The Famous Mine-to-Market Quality Line!

1 **HIGHEST GRADE COPPER.** Phelps Dodge refrigeration tube is made of the finest copper from Phelps Dodge's own U.S. open-pit mines. Smelting and refining of the copper ore are also done by Phelps Dodge to assure lasting quality.

2 **FINEST QUALITY CONTROL.** Phelps Dodge refrigeration tube is carefully controlled for quality throughout fabrication, rigorously tested before being packaged to assure finest tube properties and lasting quality in service.



3 **COLOR-CODED ACR TUBE.** Phelps Dodge ACR tube is specially cleaned for refrigeration use. Extra-long coded end caps are your assurance of factory-clean tube at job site. Tube is color coded "ACR" for your protection.

Quality tube sold the quality way—through authorized wholesalers!

PHELPS DODGE COPPER PRODUCTS CORPORATION

New York, N.Y. • Los Angeles, Calif.

Heat Pump for Existing Building

Old Lincoln Motor Div. Building In Detroit Being Conditioned Year-Round by Air-To-Water System

By George M. Hanning

DETROIT — An unusual application of the heat pump is being installed by the Detroit Edison Co. at its Warren Service Center on Detroit's west side.

The utility is currently installing a 750-hp air-to-water system to heat and cool a 40-year-old two-building complex at what once had been the Lincoln Motor Div. plant of the Ford Motor Co. at Warren and Livernois avenues. The huge plant is now owned by the utility and is being converted to its use.

The system is designed to heat and cool the 125,000 sq ft of floor space without the use of supplementary resistance heat or heat from any other fuel and without any modification of the buildings to favor the heat pump. (Exception: resistance heat will be used in lavatories and a non-air conditioned bridge connecting two buildings).

Present use of the buildings as office space (the ground floor of the larger building is leased to the A & P food chain for regional offices) and as meter storage, laboratory, and service area does not provide any offsetting internal heat loads from industrial processing to favor the heat pump over a straight heating and cooling system.

In fact, Jim Livermore, assistant director of the utility's engineering design department, pointed out, the two-building complex—a five-story and four-story building connected by a single-story area—provides far more skin load than a single building with equal area.

May Open Big Market

"This is not a case of setting up an ideal system," Livermore commented. "It's a case of working with what we have."

"Under these circumstances, we consider this to be a real test for what may prove to be a very large market for the heat pump," asserts Pat Dwyer, supervisor of heating sales for the utility.

"Obviously, figures on economy of operation will be most interesting. Our studies indicate that operating costs will not be too far out of line with any other type of system we might have selected.

"Both Alfred Kasameyer, our superintendent of buildings and properties, who will be responsible for the operation of the system and who participated in its design, and I believe the flexibility of the system will be its outstanding feature.

"We know from experience with our other buildings that space use changes radically over the years. What starts out as a meter department may later become a lunchroom and then be switched to a library.

"With the zone control we have designed into this system, we feel we can take care of radically altered demands in any space."

He credited success of the heat pump system in the Flick-Ready Corp. plant near Chicago with inspiring Edison to try it in Detroit. (For description of the Flick-Ready installation, see May 4, 1959 issue of the NEWS, page 14).

The system was described to the NEWS by Ross Polkinghorne, Edison design supervisor responsible for the engineering work. During the early stages of the heat pump portion of the job, Robert Werden, Valley Engineering Co., Glenside, Pa., served as consultant.

Use Two Centrifugals

Heart of the system is two Carrier compressors using R-11. One is a 500-hp centrifugal low pressure machine and the other a 250-hp high pressure unit. Both are multi-stage with seven speed wound rotor motors.

The two compressors will be piped together so that either or both will operate as the load demands. The smaller compressor is expected to carry the load most of the time, Polkinghorne noted.

The compressors are piped so that the 500-hp unit will either discharge into the suction of the smaller compressor or bypass it as load demands.

To control the output of the compressors under widely varying load conditions, a damper on the suction line of the 500-hp compressor will trim gas flow to either or both compressors as motor speed changes.

"Under some conditions," Polkinghorne said, "the system will operate under as much as 28 in. of vacuum."

The condenser is fitted with two separate tube bundles. One bundle is part of the hot water system to the fan coil units and the other is in the condensing water system.

Heat, Cool at Same Time

In this way, he explained, "we will be able to do both heating and cooling at the same time."

Evaporator of the system is a chiller cooling trichlorethylene brine. Brine will be pumped from the chiller to a water cooler for heat transfer to the chilled water circulating system or, when extra heat is needed on the heating cycle, to finned coils mounted in the cooling towers where it will pick up heat from the air.

All of this system is housed in a third building adjacent to the two to be air conditioned. The compressors are being installed on the ground floor and two forced draft, plastic plate filled Carrier cooling towers on the roof above the fourth floor.

Because the towers will operate during the winter as well as the summer, the sump tank for them is installed inside the building. Water in the sump will also be used to defrost the brine coils above the cooling towers.

It will work this way, Polkinghorne explained. A 15-gpm pump will circulate sump water through the condenser in winter to maintain a 70°F temperature in the tower sump tank. When frost accumulation causes the drop in air pressure through the brine coils to become exces-

Check these other benefits of **NEW** General Electric 30- and 40-amp starters . . .

LOWER POWER REQUIREMENTS, LONGER CONTACT LIFE

General Electric now adds the newly designed 30- and 40-amp series of contactors and starters to the present 50- and 60-amp forms. This means a complete line of rugged, compact, economical air conditioning and refrigeration controls is now available to fit your specific needs for:

- **compressor motor applications**
- **special panel mounting applications**

Here are features you'll especially like about the new 30- and 40-amp forms.

SMALLER SIZE—new contactors and starters require less mounting space than former 30- and 40-amp models. They're smaller, yet both handle applications up to 600 volts.

*CR NUMBER	MAXIMUM RATINGS					
	Full Load Amps			Locked Rotor Amps		
	220V	440V	550V	220V	440V	550V
CR154 C	30	15	15	180	90	72
CR154 D	40	20	20	240	120	96
CR154 E	50	25	25	300	150	120
CR154 F	60	30	30	360	180	144

* For starters only. Change CR number to CR153 C, D, E, and F for contactors at same rating.

POWER REQUIREMENTS REDUCED—both the new forms require only 4.5 watts, a reduction from 3.5 to 9.5 watts over previous forms. Result: a smaller control transformer can be used; lower component temperatures mean increased life, less maintenance cost.

CONTACT RELIABILITY—vertical double break silver cadmium oxide contacts shrug off dust, resist contact welding.

Still other important features include:

- **Quick trip or standard overloads**
- **Optional "push-on" coil terminals**
- **Easy three-point keyhole mounting**

Ask your General Electric Sales Engineer for more information, or write for bulletin GEA-7316, General Electric Co., Section 811-20, Schenectady 5, New York.

You get **MEASURABLE ADVANTAGES** with General Electric Control

Progress Is Our Most Important Product

GENERAL ELECTRIC

sive, a pressure differential controller will actuate an indicator in the machine room.

Cooling Tower Operation

The engineer will then manually shut off the fan of one of the cooling towers and start the regular cooling tower pump. The pump will send 70° water from the sump through spray headers over the brine coils for three minutes. When the coils are defrosted, the engineer will stop the pump and restart the fan.

Polkinghorne belieces that by using water defrost and melting the ice from the outside rather than the inside, ice accumulation at the bottom of the tower will be avoided.

From the heat exchangers, the system will pump water at close to 110° and at 45° to five air handling units in the two large buildings. Year-round design conditions in the air conditioned spaces will be 75° Db with 55° dewpoint and about 50% rh.

Because of existing conditions, air must be handled differently in the five-story building than in the other, Polkinghorne noted.

Existing Air System

The five-story building has for years been air conditioned with a central system. Edison, in taking over, decided to make as much use as possible of this system.

With the heat pump, it will use the central system to take care of the humidity and lighting loads and part of the occupancy load. Remainder of the occupancy load and all of the perimeter skin load will be handled by 155 Marlo under window fan-coils units using 100% recirculated air.

Actually there are two central systems with air handling units in the basement at either end of the building. One has 26,000-cfm capacity and the other 22,400 cfm. The old Sturtevant fans are being retained, but new McQuay coils and American Air Filter PL-24 filters are being installed.

Because the central system is expected to do all the dehumidifying, air will first pass over the cooling coil and then over a reheat coil before circulating through the duct system to ceiling diffusers throughout the building.

Outside Air from Roof

Outside air will be brought from the roof through a central shaft and split to the two air handling units. Return air from corridors on each floor will also be fed into this shaft and mixed with the fresh air.

A two-speed fresh air fan at the roof opening will push air into the shaft. It will operate at 7,5000 cfm when either the kitchen or toilet exhaust fans are on and at 15,000 cfm when both exhaust fans are on.

Water will enter the cooling coil at the central air handling units at 45° and leave at about 50°. Then it will circulate to the three-pipe systems serving the perimeter fan coil units. Both cool and hot water will be metered into the fan coil units to maintain a water temperature no lower than 60° so as to stay above dewpoint. As previously mentioned, these units will remove sensible heat only.

Under Window Units

Each of the under window units is equipped with three-speed fan, filter, and modulating three-way sequencing valve controlled by a Minneapolis-Honeywell thermostat on the face of the unit.

The other building, because it had not been previously air conditioned, offered the designers an opportunity to gain more flexibility.

The perimeter system with 44 fan coil units under windows and the water circulation system is the same as described above.

But in the four-story building, three air handling units are being installed on the third floor, each to serve a particular area, each to have its own fresh air and return systems.

Why 3 Fan Rooms

"Three fan rooms are used," Polkinghorne said, "to hold down the return air velocities in the corridors."

The largest air handling unit, with a Westinghouse fan of 23,200 cfm capacity, will serve six of the buildings' 15 zones. A second unit with a 17,000 cfm fan will serve five zones, and the smallest with a 16,100 cfm fan will serve four zones.

Cooling coils for dehumidification purposes only will be installed in the fan rooms. Heating and cooling coils will be installed in plenums at each zone to give maximum flexibility to meet the changing space uses, he added. Within zones, air is ducted to ceiling diffusers.

Dwyer noted that Edison, with the advise of Werden, designed the heat pump system itself. The company is installing it and will operate it with its own personnel.

Hill Is Hall-Neal Chief Engineer

INDIANAPOLIS — The appointment of Robert W. Hill as chief engineer of Hall-Neal Furnace Co. was announced by Fred S. Boone, president.

R. W. Hill

Hill comes here from Dowagiac where he was chief engineer of Premier Furnace Co. and formerly was with Meyer Furnace Co. in Peoria, Ill.

Removes MORE SCALE per Dollar Spent!

VAPCO SCALE REMOVER

The activated acid in powder form containing inhibitor, wetting agent and algaecide for a COMPLETE cleaning job under the most severe conditions. Easy on galvanize — safe for equipment. Keeps head pressure down — efficiency UP! 10 to 50 pound drums with "Tel-Action" pH indicators.

VAPCO-HIB

Make your own cleaner with VAPCO-HIB. Added to muriatic acid, VAPCO-HIB increases the acid action, yet provides outstanding protection to metals including galvanize. Supplied in 8 and 32 ounce bottles and bulk.

Vapco QUALITY PRODUCTS

Complete literature on request or see your dealer TODAY!

GARMAN COMPANY
ST. LOUIS 25, MO.

BUY SPORLAN *Catch-Alls*

. . . the Perfect Filter-Drier for every capacity
from fractional horse-power units to large capacity installations

Sporlan offers a complete range of Catch-Alls engineered to fit every application, from domestic refrigerators, small freezers and vending machines to the largest commercial and industrial refrigeration and air conditioning systems, with every conceivable job size in between.

No matter how large or small the job you are planning, your filter-drier worries stop when you buy Sporlan Catch-Alls.

In addition, the Sporlan Catch-All is the perfect filter-drier because . . .

- Desiccants are molded into a porous core.
- Maximum drying through highest degree of activation.
- Filtering instead of straining.
- Superior acid removal.
- Refrigerant cannot channel through or by-pass around the core.
- Core will not powder or pack.
- Full line flow protection for any size system.
- Connections are protected by moisture and tamper-proof seals.

See your Sporlan Wholesaler for your Catch-All needs today and ask him for a copy of Bulletin 40-10.

See you at
Booth No. 1254
15th INTERNATIONAL
HEATING & AIR CONDITIONING EXPOSITION
Chicago, Illinois February 13-16, 1961

SPORLAN VALVE COMPANY
7525 SUSSEX AVENUE ST. LOUIS 17, MISSOURI

EXPORT DEPT. • 85 BROAD STREET • NEW YORK 4, N. Y.

Are You Getting Best Results from

Your Accounting Procedures?

Do They Help You Keep Costs Low In Relation To Sales?

NEW ORLEANS — How to run an accounting system and how to obtain the best results from it is one of the more important problems a businessman must consider if he is to get the results required by management for greater efficiency.

That is the opinion of H. E. Humphreys, president of H. E. Humphreys Co., Inc. of Concord, N. H., who spoke on the subject at the National Commercial Refrigeration Sales Association convention here recently.

What constitutes good procedure? Humphreys asked. In general, two basic tests may be applied, the commercial refrigeration distributor answered.

1. Is the procedure producing the desired results?

2. Is it producing them as economically and efficiently as possible?

"Good accounting procedure provides management with the information it needs to keep costs low with relation to sales," he declared. "Good procedure reveals inefficiency and waste."

Humphreys continued:

"Lacking good procedure, substantial wastes may remain hidden. Lacking the basis for knowing where overhead costs are excessive and the mechanics of keeping them under observation, management certainly has no adequate means of controlling and fixing the responsibility for excesses.

"Good procedure results from a properly coordinated system, whether it relates to sales, accounts receivable, cash-collecting, or cost-finding. A series of organization charts indicates lines of authority and responsibility, without which no system can or will function well. If there is not a straight flow of authority and a clear outline of responsibility, then indifference and carelessness will sap the vitality of the business.

"Without carefully designed forms and records, information obtained in the course of affairs may be so lacking in essential detail as to be utterly useless to management.

"Job descriptions, flow charts, and manuals of procedure are vitally necessary so that work will be performed correctly and will *repeatedly* be performed in the same uniform manner. There must be one *best* method of handling each business transaction so that it will be done without error.

Three Methods of Internal Control

"Part of any good plan or procedure should emphasize the following principles:

"1) Have more than one person involved in the completion and recording of every business transaction. This provides a check on the accuracy of the work and reduces the possibility of error.

"2) Have the handling of physical assets — cash, equipment, or merchandise — separate and distinct from the recording. For example, the actual receipt of cash by a cashier should require that some other person maintain the record.

"3) Have as much as possible of the work performed with the use of office machines or appliances, which maintain some mechanical means of proving or checking the accuracy of the work as it is being completed.

"The nature and extent of these three methods of internal control will, of course, be dependent on the size of the business. For instance, a company may be too small to have a purchasing agent, so the owner or manager generally approves orders for merchandise to be purchased.

"He should, however, have some form of proof that there is need for the merchandise before he passes on the order. In this regard he effectively works with the parts manager so that unnecessary expense is not incurred.

"He is in a position to not only approve necessary expenditures, but to use judgment in determining quantities to be purchased. In this function he avails himself of the opportunity of discounts accruing from quantity purchases.

"The interaction of the owner and parts manager, therefore, serve a purpose which neither, of and by himself, would likely be in good position to accomplish.

Receiving Department Procedure

"Another area which requires well-defined procedure is the receiving department. The clerk or stockman is responsible for checking quality and quantity of merchandise received, properly preparing receiving-reports and keeping stock records.

"Lack of good procedure in the receiving department could result in error, delay, and the costly inconvenience of inadequate records.

"In logical sequence, goods which have been ordered and received, have to be paid for. In the accounts payable department, the stock clerk's receiving report should be checked carefully against the supplier's invoice, before approval is made for payment.

"Errors and omissions are noted so that the business pays only for what it receives, and at the proper price, including all applicable discounts.

Check on Merchandise

"The next step in good internal procedure relates to the sale of the merchandise which has been purchased. Every precaution should be taken to see that the merchandise actually billed is the merchandise that is packed and shipped or delivered and installed.

"The proper prices, naturally, must be charged, and the accounting records must show

(Continued on next page)

5-fan Binks cooling tower. Original 2-fan unit has operated since 1951 without need for replacement of any component parts.

Chief Engineer Karl Hecht at control panel of Binks cooling tower. Tower cools 7,050 GPM.

AT HARRIS TRUST & SAVINGS BANK, CHICAGO

modular design, servicing ease determine cooling tower choice!

The first Binks 2-K tower, erected at the Harris Trust & Savings Bank in 1951, has required less than one day's maintenance per year and has given satisfactory service. When the bank decided to build a new 23-story building in 1959 it selected a Binks tower to retain continuity in their equipment.

Modular design of the Binks 2-K made it simple to add a 3-fan section to the original 2-fan installation. Standardized construction eliminated the need for expensive modifications.

It's easy to specify Binks standard cooling towers. Whatever your requirements . . . capacity, quietness, induced or forced draft . . . there's a Binks cooling tower that fits your needs exactly.

For complete information . . .

. . . write to the address below. Give dimensions, capacities and other specifications and performance data needed.

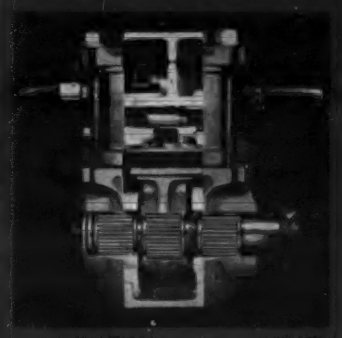
Binks
EVERYTHING FOR WATER COOLING

A COMPLETE LINE OF NATURAL DRAFT AND MECHANICAL DRAFT COOLING TOWERS AND INDUSTRIAL SPRAY NOZZLES

Binks Manufacturing Company
3118 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U.S. & CANADIAN CITIES • SEE YOUR CLASSIFIED DIRECTORY

NEW!
ACID RESISTANT
PUMP
FOR DESCALING CONDENSERS
FOR CIRCULATING R-11 WHEN CLEANING HERMETIC BURNOUTS



ACE MODEL 77 NRS
DIAPHRAGM PUMP

Delivers top cleaning efficiency through reciprocating pump surge action! All parts in contact with liquid completely acid resistant! More good news! The Model 77 NRS has no seals to leak and is so designed that it can run dry for hours without damage.

PLUS A COMPLETE LINE OF ACE

ACE PUMPS

entries for all sales whether for cash or on account. Any weakness or lack of good procedure in this area could be costly, both from a cash standpoint as well as a loss of goodwill and cordial customer relationship.

"If, because of lack of control, a few thousand dollars worth of merchandise leaves the business without being billed, the costly result is, I'm sure, obvious.

"Many of the points I mention seem to be almost too obvious, but the controls are more difficult to 'control' than they are to talk about. By the same token they are far too important *not* to talk about.

Internal Control of Business Expense

"Aside from purchases of merchandise, good procedure demands that there be adequate internal control of business expenses. These include selling expenses, service department expenses, administrative, financial, credit, and collection expenses.

"Every attempt must be made to be sure that all expenses are legitimate and genuine before they can be approved for payment. Without exception, every expense involving a cash payment should be verified and approved by a department head.

"Salesmen's compensation should be determined from a carefully prepared schedule taken from the sales records and approved by the sales manager.

"Too little emphasis is placed on restricting long distance phone calls and telegrams. Rather than relying on approval of the telephone bill which, after all, has to be paid, more thought should be given to the control of this expense.

Checking Freight, Delivery Bills

"All freight, and delivery bills should be carefully checked, not only for errors in addition, extension, and total, but for classification and rate as well. This item alone can account for considerable loss if there is no sound procedure for control.

"Good procedure demands that management be acquainted with the true and accurate cash position of the business at any hour of any day, with a minimum of delay in obtaining that information. Uncertainty as to the cash position may result in an overdrawn bank account, which is most undesirable.

"It might mean that attractive purchase discounts would be lost because of a reluctance to disburse against possible non-existent cash.

"A full and complete knowledge of the cash position enables an owner or manager to more accurately project the company's anticipated requirements, especially where short term borrowing may be indicated.

"The importance of safeguarding the actual cash cannot be over-emphasized. The actual flow of cash in the business must be controlled by definite and undeviating procedure so that there is no opportunity of funds being siphoned off into unintended channels.

"All cash sales should be recorded in a cash register, where a machine tape should be made part of the permanent record for the bookkeeping department, particularly for small items.

Definite Procedure For Bank Deposits

"Definite procedure should be established as to who is to make bank deposits and when they are to be made.

"A good psychological effect to discourage any unauthorized liberties in the cash procedure is established when all concerned are aware that a reliable system of control is in operation.

"The necessity of good procedure—especially good accounting procedure—is absolutely imperative under changing market conditions. Only by maintaining a perpetual state of 'alert,' may a business hope to stay in satisfactory adjustment with the forces which surround it.

"In meeting and maintaining relations with these external forces, management has accomplished only one-half of its task. The other half deals with its internal operation. This is where the importance of good procedure and effective organization becomes apparent.

"Management has to first create an effective organization and staff it with capable and loyal employes. It must then meet and solve the many specific and tecnical problems that arise internally.

"In this area the *way* things are done is as important as *what* things are done. Getting things done on time, with efficiency and consistency is not easy. It represents a continuous vigil over the network of clerical processes, machine methods, human nature, and other intangible factors.

"The profit system as we know it depends on our willingness and ability to analyze procedures, so that we can employ those calculated to give us the best results, in the least time and at the lowest cost."

Bohn's Danville Div. Names W. B. Buck

DANVILLE, Ill. — Appointment of Willard B. Buck as sales manager, air conditioning, has been announced by H. Blake Thomas, vice president and general manager of the Danville Div. of Bohn Aluminum & Brass Corp.

W. B. Buck

After graduating in 1946 from the University of Minnesota with a B.S. degree in mechanical and aeronautical engineering, Buck was an instructor in the Minneapolis Sales School of Minneapolis-Honeywell.

He was later a manufacturers' representative and, more recently, was employed in sales management positions.

For Performance — Capacity — Low Maintenance

Select a

LARKIN ZEPHYRCON

Air-Cooled Condenser

9 Belt-Driven Models—5 to 40 Tons 5 Direct-Drive Models—2 to 10 Tons

ENGINEERED FOR PARALLEL USE FOR VIRTUALLY ANY CAPACITY

Larkin Zephyrcon Air-Cooled Condensers are available in two series: direct-drive FC models—for economy and minimum maintenance; and belt-driven BFC models—for larger installations and the lowest possible noise level.

Multiple circuits—for operating more than one compressor from a single condenser—are available for all models at no extra cost.

PEAK PERFORMANCE YEAR 'ROUND

When used with the Larkin Posi-Trol control system, which maintains head pressures in low ambient temperatures, the Larkin Zephyrcon functions at peak performance the year 'round in any climate.

Compare the features point for point; check the performance data, and make the wise selection—Larkin Zephyrcon Air Cooled Condenser.

BASIC RATINGS (30° + D)

FC SERIES — DIRECT DRIVE

Model No.	Capacity at Evaporator BTU/HR	Tons	Cfm
FC-2	27,700	2.30	2500
FC-3	37,350	3.21	3500
FC-5	62,500	5.21	5500
FC-8	95,600	7.96	7500
FC-10	124,000	10.3	9100

BFC SERIES — BELT DRIVEN

Model No.	Capacity at Evaporator BTU/HR	Tons	Cfm
BFC-5	62,500	5.21	5500
BFC-8	95,600	7.96	7500
BFC-10	124,000	10.3	9100
BFC-13	149,200	12.4	12000
BFC-16	191,200	15.92	15000
BFC-20	248,000	20.6	18200
BFC-26	298,400	24.8	24000
BFC-32	382,400	31.8	30000
BFC-40	496,000	41.2	36400

OUTSTANDING FEATURES

- Patented Larkin cross-fin coil — aluminum fins and staggered copper tubes.
- For use indoors or outdoors.
- A single large fan on BFC model assures low operating noise level.
- Motor on BFC model is standard NEMA design mounted on adjustable base.
- Slow speed motor on FC model is permanently lubricated, has overload protection, and is mounted on resilient base.
- Casing is of heavy-gauge steel.
- Unit finished with baked-on epon-base primer and melamine top coat for maximum protection.
- Motor is enclosed in casing, protected from the weather.
- Discharge shield available.
- Fan Guard is standard equipment.
- Return bends protected by heavy-gauge shield.

See Your Wholesaler
Or write for Bulletin 1031-C

LARKIN COILS INC.

519 Memorial Drive, S.E. • P. O. Box 1699 • MUrray 8-3171

ATLANTA 1, GEORGIA

MIGHTY MITE PROTECTS MOTORS Against OVERLOADS OVER VOLTAGE UNDER VOLTAGE

MECHANICAL INDUSTRIES PRODUCTION CO.
223 Ash Street Akron, Ohio

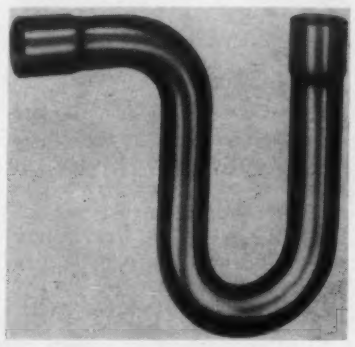
TECH CENTER

by
FRANK J. VERSAGI

Research + RSES + Manufacturer = New Product

With the Refrigeration Service Engineers Society serving as the leavening, a college sponsored research project has resulted in introduction of a product which will help improve performance of refrigeration cycles.

Mueller Brass Co., Port Huron, Mich., is now, or soon will be, selling P-traps as recommended by RSES after publication of research findings by California State Polytechnic college's department of refrigeration and air conditioning.



The fabricated P-traps will do the job of more cumbersome assemblies of individual fittings, but will accomplish the task of aiding oil return at lower cost and with a better finished appearance.

Dr. Norman Sharpe of Cal-Poly reported to the 22nd annual convention of RSES in a paper called "Oil Migration in Refrigerant-12 and Refrigerant-22 Systems." That was in November, 1959.

The pertinent paragraphs of his conclusions are in boldface type below.

According to John Spence, educational director of RSES, the society set about interesting manufacturers in the possibilities suggested by Sharpe's report.

"Spence's diligence undoubtedly spurred us into faster action than we might otherwise have considered," admits Vin Bower, manager of Mueller Brass's wholesale division. "He convinced us that there is a real need for this product."

The company is producing P-traps of ⅞ and 1⅛-in. sizes. "If these go well, we'll tool up for 1⅜ in.," says Bower.

Spence is enthusiastic. "To me, Frank," he writes, "this forward step by Mueller means about the same thing to the refrigeration and air conditioning industry as adding of a self-starter to cars many years ago."

RSES has included Sharpe's report in its Service Application Manual. It is labeled "Section 66" and begins on page 6621 of SAM.

Insofar as his tests would allow practical interpretation, Sharpe made the following piping and lubrication recommendations in his report:

1. The maintenance of low oil concentration in the circulating refrigerant can simplify piping design. If the concentration of oil in the circulating refrigerant is maintained at a low level (say 0.6% by weight or lower) little difficulty will be encountered with oil migration in the system since at low concentrations the two main modes of travel are as a mist and as a colloidal dispersion. The main precaution to be observed is that of tapping suction line branches into the top of horizontal mains since some oil, even at low concentrations, does appear at the bottom of horizontal runs. When the branch is tapped into the top of the horizontal run, no oil drainage will then occur into the branch when vapor is not flowing in the branch. With low oil concentration suction lines may be sized for low pressure loss so that the capacity loss due to friction will be small.

2. The concentration of oil in the circulating refrigerant may be maintained at a low level by suitable compressor design or by the use of a discharge line oil separator.

3. Maintain low concentration of oil in the circulating refrigerant on low temperature systems. At present this will usually require the use of a discharge line separator. While suitable oil return may be achieved on low temperature systems without the use of a discharge line oil separator, the use of the separator will insure a better rate of heat transfer in the evaporator.

4. Maintain low concentration of oil in the circulating refrigerant if the lines are long and branched and if instability of operation of the system is expected.

Instability can be caused by sudden changes of capacity, improper drainage at the bulb of the thermal expansion valve, oversize of the thermal expansion valves either at full or partial loads, sudden changes of suction pressure due to improper action of cylinder unloaders, etc.

At high oil concentrations the oil circulates largely by film travel. While the rate of this travel could not be accurately measured, it was found to be very slow. Any instability in the operation of the system which would vary the oil concentration in the circulating refrigerant would vary the crankcase oil level if the lines were long.

5. If the oil concentration in the circulating refrigerant is expected to be appreciable (say above 0.6%) and if low vapor velocity is to be encountered during any normal operating condition of the system, use "P" shaped traps at the bottom of all suction risers to drain the oil from the horizontal runs approaching these risers.

Critical vapor velocities for upward oil film travel in all sizes of risers was not determined; however, for the 1.0 in. inside diameter glass riser, the transition region from a downward rippling movement of the oil

WAGNER® MOTORS AT WORK

power to cool a clerical center

Two Wagner® 900 hp motors utilize easily accessible low voltage power to drive centrifugal compressors in New York's Interchurch Center

One of the newest office buildings in the city, the 19-story Interchurch Center houses more than 2,000 workers. It is completely air conditioned . . . all 400,000 square feet of it.

It's a big job, powering the centrifugal compressors in a system that is designed to air condition that much space. A job usually handled by high voltage motors, but done here by two 900 hp Wagner® Type RP open type motors rated at 460 volts, 1750 RPM. They were specified to take advantage of an easily accessible low voltage power supply, and so eliminate the expense of running in a high voltage line. How do they perform under loads created by centrifugal compressors? Simply put, they operate at peak efficiency, day in and day out.

Compact and dripproof, Wagner RP motors are packed with power and stamina. They're the perfect drives for big pumps, fans, and blowers as well as compressors. Built in frame sizes 504U through 962S, Wagner open type motors are available in ratings through 1000 horsepower.

Want your motor application analyzed? Call your Wagner Sales Engineer. His recommendations, and Wagner motors, will serve you well.

THE INTERCHURCH CENTER
Owner: The Interchurch Center
Architects:
Collens, Willis and Beckonert
Vorhees Walker Smith Smith & Haines
General Contractor:
Turner Construction Company
Mechanical Contractor:
Raisler Corporation

Branches and Distributors in all Principal Cities
Wagner Electric Corporation
6441 PLYMOUTH AVENUE, ST. LOUIS 33, MISSOURI

WM61-1

film to an upward rippling movement was between 500 and 600 fpm. Satisfactory oil return was achieved with both downward and upward rippling movements when a glass "P" shaped trap was used at the bottom of the riser without excessive accumulation of oil at the bottom of the trap.

6. If appreciable concentration of oil in the circulating refrigerant is expected, special attention should be given to a suction riser following a horizontal evaporator connection on which the bulb of a thermal expansion valve is clamped. If the horizontal run is not properly drained, erratic operation of the expansion valve may result. Such unstable operation will result in varying oil concentrations in the circulating refrigerant with consequent variation in the crankcase oil level. A "P" shaped trap should, therefore, be used to connect the horizontal connection to the riser.

7. If the concentration of oil in the circulating refrigerant is low, a naphthene base oil with a viscosity of 300 SSU may be satisfactorily used with Refrigerant-22 at evaporating temperatures down to -90°F. It is desirable that the compressor use the same viscosity oil at low evaporating temperature as at normal evaporating temperatures, since the temperature of the compressor may be equal or higher than that when operating at normal evaporating temperatures.

Low temperature systems should be designed so that there will be a low concentration of oil in the circulating refrigerant to insure a proper rate of heat transfer in the evaporator. This low concentration can be achieved with the use of a discharge line oil separator or by compressor design.

Dole Names Nelsen Service Manager

CHICAGO—The appointment of Loris M. Nelsen as national service manager for Dole Refrigerating Co. has been announced by H. P. Hansen, executive vice president.

L. M. Nelsen

Nelsen comes to his new position with an extensive service organizational background in domestic, commercial, and industrial refrigeration, it was noted.

His duties will consist of establishing company service policy, product warranties, and conducting service training programs. In addition, Nelsen will supervise quality control at the factory along with final test and inspection of products.

The appointment of George E. Harrington to Dole's sales engineering staff was also announced by J. E. Hutchinson, general sales manager. He has had extensive experience in commercial and industrial refrigeration.

Harrington will be specializing in the application of Dole products to the freezing and processing industry. He will headquarter in the Chicago office.

Electronic Control Courses Offered

BIRMINGHAM, Ala. — Six electronic motor control courses for employes of independent electrical apparatus service firms in North America will be held in major cities in March, April, and May by the Electrical Apparatus Service Association, Inc.

This has been announced by Walter Brush of Electric Motor Service, Inc., here, chairman of the EASA Engineer's Advisory Committee.

EASA is the new name of the National Industrial Service Association, Inc., effective April 1, 1961. It is an international trade association with 1,600 member firms in five countries.

The five-day courses will be held in Philadelphia, March 6-10; Boston, March 20-24; Atlanta, April 3-7; Oklahoma City, April 17-21; Los Angeles, May 1-5; and Minneapolis, May 15-19.

Each course will be directed by G. D. Long, instructor of maintenance schools, Reliance Electric & Engineering Co., Cleveland.

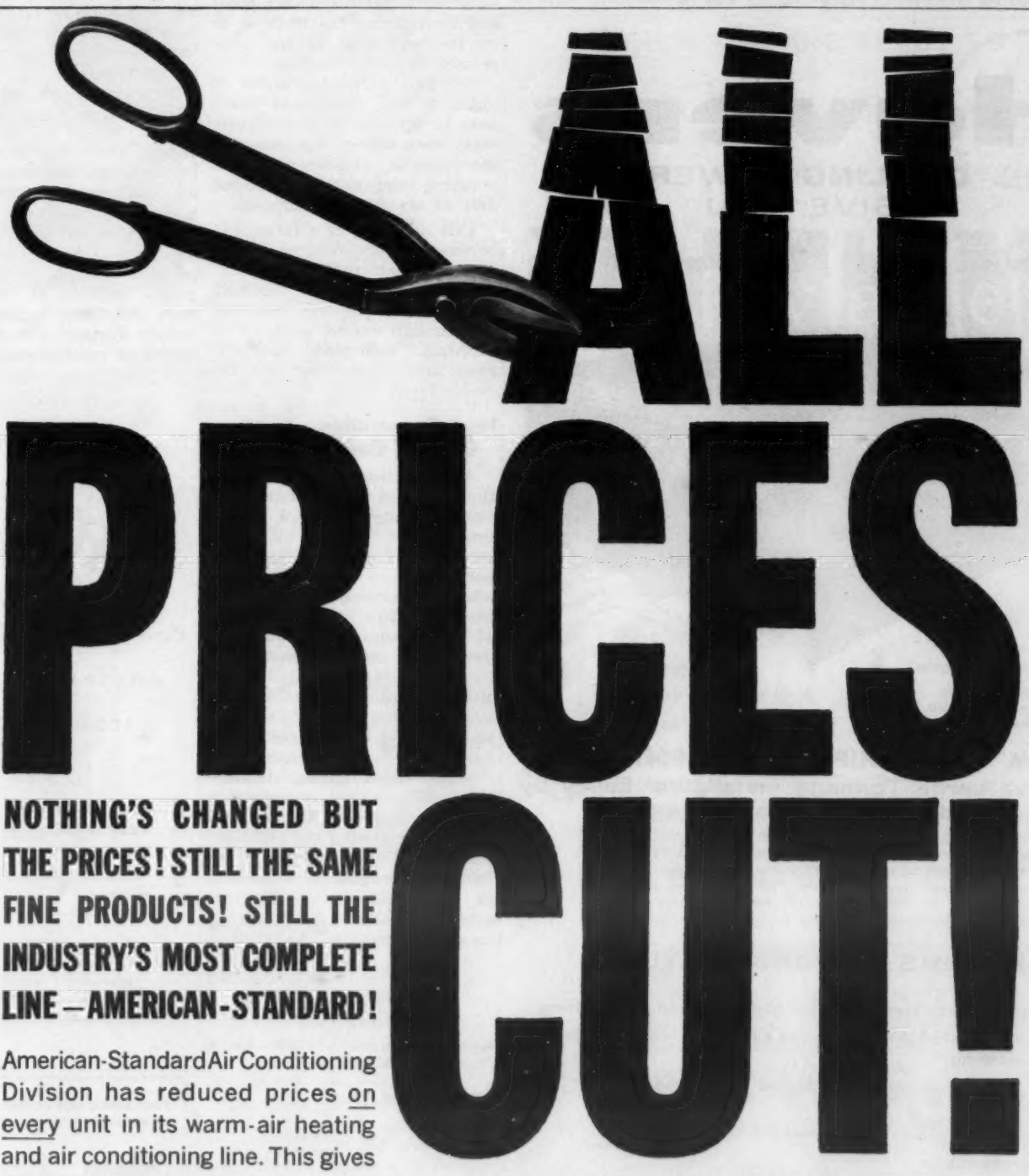
The program will begin with lectures and discussions on basic electricity and electronics and range through control of motor and generator fields, variable speed control, internal circuitry, trouble shooting methods, magnetic amplifiers.

Courses will be limited to 50 persons each on a first-come, first served basis, according to Baechle. An enrollment fee of $65 covers text and laboratory materials, equipment rental, and overhead. Applications should be sent to A. A. Baechle at EASA headquarters, 7730 Carondelet Ave., St. Louis 5, Mo.

REFRIGERATION — "for the preservation of food"

AIR CONDITIONING — "for the preservation of health"

These Slogans are prominently displayed on all the service trucks of Air Modern, Inc., Long Island, N. Y. Joseph Galletta, owner of Air Modern states, "I believe the industry needs and should adopt a slogan which will easily be remembered and also points out the importance of our business to the community."



NOTHING'S CHANGED BUT THE PRICES! STILL THE SAME FINE PRODUCTS! STILL THE INDUSTRY'S MOST COMPLETE LINE—AMERICAN-STANDARD!

American-Standard Air Conditioning Division has reduced prices on every unit in its warm-air heating and air conditioning line. This gives American-Standard Dealers the most powerful competitive position in the business—an opportunity to match them all on price and beat them all on quality! You can make the upcoming cooling and heating seasons the most profitable ever. Contact your American-Standard Air Conditioning Division Distributor for his new, low price list. Call him today!

If you are not an American-Standard dealer—right now's the profitable time to become one! Call your nearby distributor, or write: American-Standard Air Conditioning Division, 40 West 40th Street, New York 18, N. Y.

American-Standard and Standard® are trademarks of American Radiator & Standard Sanitary Corporation

AMERICAN-Standard
AIR CONDITIONING DIVISION

Packaged Multi-Zone Air Conditioners

How One Manufacturer Goes About Designing New Line (3)

How does a manufacturer go about designing a new line of air conditioners? What factors are considered in the selection of components like compressors and coils, evaporators and controls? How much weight is given to design considerations, to application engineering?

In this series of articles, Alfred D. Sullivan, development engineer for American-Standard Industrial Div., offers a lucid account of the birth of a new product.

By Alfred D. Sullivan, Development Engineer, American-Standard Industrial Div.

Choosing Evaporator

There are many choices in evaporator surface types. Disc, spiral, and plate fins are the most common, while the interesting spined or cross-milled types offer the added lure of unusually high efficiencies. Efficiency is only one criterion, however; the final decision is also based on condensate retention characteristics, clogging tendencies and cost.

In the American - Standard unit, it was felt that either disc, spiral, or plate types could be utilized to provide approximately equal performance. The prime criteria, therefore, were low retention of condensate and high resistance to clogging. The choice was narrowed to plate or spiral types. A price advantage in the large coil sizes tipped the scale in favor of the plate fin.

To determine tube diameter, number of rows in depth, and fins per inch of tube length, coil capacity was plotted against evaporating temperatures for several varieties of coils. Crossing these curves (see Fig. 5) are fractional compressor capacities also plotted against evaporating temperature. The same chart also shows sensible heat ratios for several coils under investigation.

The air entering the evaporator (as plotted in the Fig. 7 curves) is at 80°F dry bulb and 67° wet bulb. The capacity of the conditioner with any of the evaporators is obtained by selecting a likely crossing point and multiplying the Btuh/sq ft by the reciprocal of the compressor capacity fraction.

For this particular series of units, it was considered desirable to operate at a relatively high evaporating temperature; for example, 45.5° is the evaporating temperature for 30-ton unit at standard conditions.

This necessitates a large coil, because of the reduced difference between refrigerant temperature and the air wet-bulb temperature. The coil, however, has enough excess capacity to maintain nameplate tonnage, even after deducting the fan motor input.

High Evaporating Deemed Desireable

Another desirable feature is the ability of the coil to operate over a greater range of capacities without frosting up. Short cycling or frosting of the evaporator is a possibility even when the compressor can be unloaded to 25% of full load. A 45° coil can operate frost-free down to a smaller fraction of its normal capacity than can a 40° evaporator, for example. In addition, the higher sensible heat ratio of the 45° coil is advantageous in most cases.

Many times during development of packaged equipment a great deal of test time is consumed in choosing the right expansion valve. The valve manufacturers propose a succession of mysterious modifications aimed at decreasing the "swing" in suction pressure. As much as 10 psi difference between the low and high pressure readings is sometimes encountered and there are usually several cycles per minute.

In addition to reducing the refrigerating capacity of the system, these fluctuations adversely affect the capacity control settings and sometimes set up objectionable mechanical noises. Coupled with these effects there is often poor distribution of refrigerant among parallel passes with several passes running at high superheat. All these factors tend to reduce further the design capacity of the system.

Experimentation with various types of distributors in an effort to even out the refrigerant flow is a normal recourse. Much of this experimentation could be avoided, however, if the coil circuiting were arranged for a reasonable pressure drop. Any pressure drop, of course, penalizes the compressor which suffers due to increase in pressure ratio as well as an increase in specific volume of the gas.

Nevertheless it is better to take a deliberate pressure loss than to attempt taming vagrant refrigerant flow with hair-trigger devices.

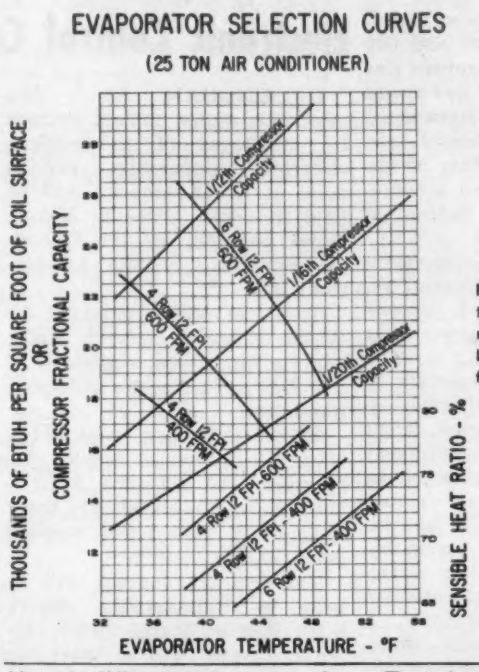
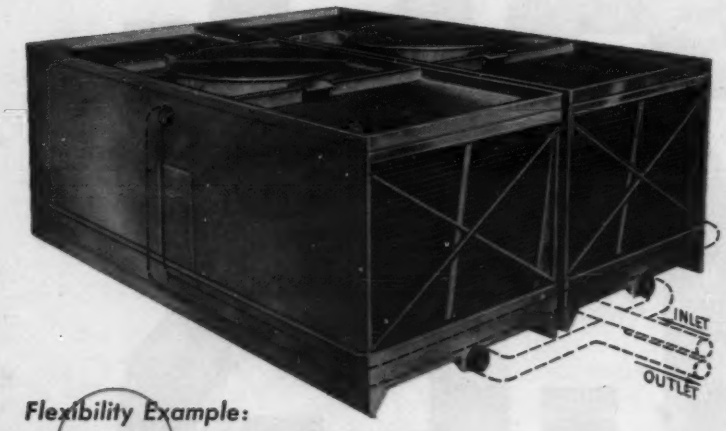

EVAPORATOR SELECTION CURVES
(25 TON AIR CONDITIONER)
THOUSANDS OF BTUH PER SQUARE FOOT OF COIL SURFACE OR COMPRESSOR FRACTIONAL CAPACITY
SENSIBLE HEAT RATIO - %
EVAPORATOR TEMPERATURE - °F
1/12th Compressor Capacity
1/16th Compressor Capacity
1/20th Compressor Capacity
6 Row 12 FPI 600 FPM
4 Row 12 FPI 600 FPM
4 Row 12 FPI 400 FPM
4 Row 12 FPI - 600 FPM
4 Row 12 FPI - 400 FPM
6 Row 12 FPI - 400 FPM

FIG. 5 — Evaporator selection curves used to determine tube diameter, number of rows in depth and fins per inch of tube length.



Flexibility Example:
Two 100 Ton Units Side by Side with Suggested Piping Method.

Havens
COOLING TOWERS GIVE YOU FLEXIBILITY

"VM" SERIES SHIPPED PRE-ASSEMBLED
Achieve Large Tonnage Installation Easily by Adding Additional Towers

Havens offers maximum flexibility with pre-assembled packaged cooling towers that **incorporate internal piping.** Large tonnage installations can be accomplished easily and at a big savings by using additional towers. Havens "VM" Packaged Towers are available in 80 - 100 - 125 and 150 ton sizes. Other capacities and styles also available.

HAVENS TOWERS FEATURE:

- Shipped assembled ready for hoisting, piping and wiring
- Easily detachable hoisting yoke eliminates elaborate slings for hoisting
- All steel construction—hot-dipped galvanized after fabrication
- All heart California redwood fill
- Low silhouette
- Anti-friction ball bearings equipped with moisture barrier seals
- Open gravity type distribution with drilled orifices and overflow standpipe
- Simple installation

Write for Literature
Havens COOLING TOWERS
Division of
HAVENS STRUCTURAL STEEL COMPANY
1713 Crystal Avenue, Kansas City 26, Missouri

PACKAGED MULTI-ZONE AIR CONDITIONER

Bearing And Coupling Locations For Optimum Alignment And Shaft Rigidity

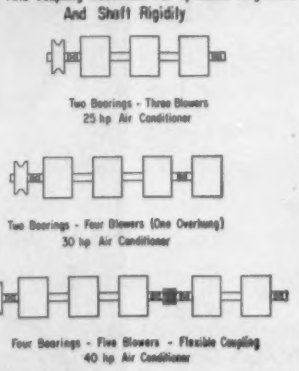

Two Bearings - Three Blowers
25 hp Air Conditioner
Two Bearings - Four Blowers (One Overhung)
30 hp Air Conditioner
Four Bearings - Five Blowers - Flexible Coupling
40 hp Air Conditioner

FIG. 6—Schematic drawing shows shaft and bearing arrangements used for three sizes of packaged multi-zone air conditioners.

TAKE IT ON EVERY JOB!

There's a chemical genie in Thawzone that works like nothing else in the world to cure and prevent trouble in refrigeration and air conditioning systems.

It eliminates freeze-ups • destroys trouble-causing moisture • helps prevent corrosion and copper plating • scavenges out oxygen • helps keep expansion valves free of sludge and rust • You avoid call backs caused by freeze-ups after servicing.

TWO OTHER AIDS FOR BETTER REFRIGERATION SERVICE

TRACE
—the simple, fast way to pinpoint refrigerant leaks . . . a positive leak tag.

Leak Lock
—the joint sealer engineered for refrigeration use.

Take Thawzone on *every* job, use it in *every* installation charged with the modern fluorine refrigerants (*Freon**, *Genetron**, etc.) or with methyl chloride, methylene chloride or isobutane. It's economical: ½ oz. treats a pound of refrigerant. And it's easy to use.

See your refrigeration wholesaler today for Thawzone and the free Thawzone Service Manual.

*Reg. Trade Names Du Pont & Allied Chemical Corp.

THAWZONE®
HIGHSIDE CHEMICALS INCORPORATED
18 Colfax Avenue • Clifton, New Jersey

One exception to this general statement is the use of thermostatic expansion valves with desensitized bulbs. These bulbs may be packaged with various materials or the bulb itself can be made from a poor conductor such as stainless steel; the latter device is utilized in the multi-zone design. This arrangement has been found to throw the valve action out of phase with the surging and ebbing of refrigerant pressure within the coil. The results of such a damping effect are frequently worth while.

Selecting the Air Moving Equipment

As indicated in the section on size determination, fan diameter was held to 12 in. to achieve the desired slim floor-space rectangle. The blowers were chosen to deliver 3,300 cfm each. The spacing between fans (⅔ fan diameter, see Fig. 6) was found to result in good air distribution over the coil, aided by a 50% free area diffuser located near the blower outlets.

The proper fan, of course, is one with a tip speed high enough to develop the desired static pressure, while simultaneously delivering the required air quantity. This happy condition was brought about by the use of a ¾ width wheel, a "special" though long standardized in manufacture.

Ball bearings were selected as the best choice for the multiple fan units being used. A reasonable service life was determined to be 40,000 hours, and bearings were specified with this in mind. Actual service life will probably exceed this since not all fans will undergo maximum loading, nor will they operate constantly.

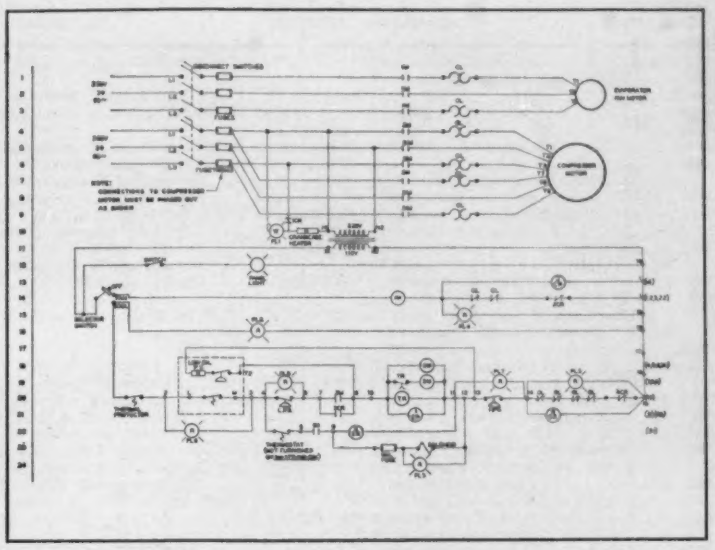


FIG. 7—Typical elementary wiring diagram for part winding starting system in packaged multi-zone air conditioners.

In a multiple fan unit where as many as five fans may be employed to achieve the desired volume of air, shaft support and alignment can be critical. Sometimes the location of the bearing mounting is treated casually with the hope that self-aligning bearing features will make up for the spread of tolerances encountered during assembly of the sheet metal housing.

In the American-Standard multi-zone units, no more than three fans are mounted on a single shaft span. Adjacent shafts are joined by flexible couplings to minimize alignment problems. The bearing mounting channel is doweled through holes located from the same die which is used to form and pierce the fan side sheets. This results in good concentricity of shaft with respect to bearings and of blower wheel with respect to fan housing.

(To Be Continued)

Emerson Electric Announces Shifts In Builder Products Group

ST. LOUIS — Emerson Electric's Builder Products Group announced that Donald J. Harper, formerly builder products manager, has been appointed builder products and merchandise sales manager.

He replaced Richard B. Loynd who moved to the Electronics & Avionics Div. of the company as assistant vice president assigned to special projects.

Louis L. Colbert, formerly lighting manager, was named assistant builder products and merchandise sales manager.

Edward K. Handlan, presently manager-air conditioning and electric heat, assumed the additional responsibility of contract sales manager.

Chattanooga Royal Names Childress, Richardson

CHATTANOOGA, Tenn. — Chattanooga Royal Co. has announced the appointment of A. Cave Richardson as vice president and general manager and George M. Childress as vice president, manufacturing and engineering.

Richardson

Childress

Richardson joined the company in March, 1960, in an administrative capacity, after having spent 32 years with the Chattanooga Div. of Combustion Engineering, Inc.

Childress has been in various manufacturing capacities with Chattanooga Royal since joining this organization in December, 1952.

Chattanooga Royal manufactures "Royal Chef" portable barbecue grills as well as gas-fired space heaters, marketed under the trade name "Royal." Gas-fired central heating units, air conditioning equipment, and water heaters are marketed under the trade name "Chattanooga." This company celebrates its 70th anniversary this year.

NEW RBM

25 AMP — 2 AND 3 POLE

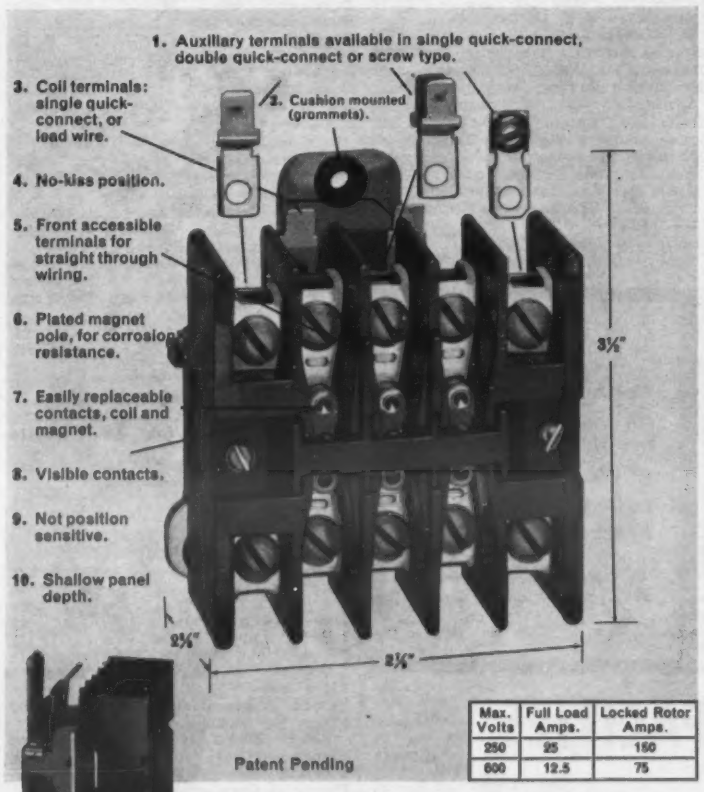
CONTACTOR

TYPE 85

DESIGNED FOR UL AND CSA LISTING

Simplifies panel circuitry — helps eliminate terminal boards — cuts wiring costs.

Here is the first air conditioning contactor designed so auxiliary terminals can be added to power wiring terminals. Also, extra dummy wiring terminals can be added when required. Such flexibility can help eliminate terminal boards, lower wiring costs, and provide more versatile and simplified panel circuitry. Auxiliary terminals can be #8 screw or ¼" single or double quick-connect. Dummy terminals are #10 screw with or without the auxiliary terminals. Consult your application engineer or write for Bulletin C16.


1. Auxiliary terminals available in single quick-connect, double quick-connect or screw type.
2. Cushion mounted (grommets).
3. Coil terminals: single quick-connect, or lead wire.
4. No-kiss position.
5. Front accessible terminals for straight through wiring.
6. Plated magnet pole, for corrosion resistance.
7. Easily replaceable contacts, coil and magnet.
8. Visible contacts.
9. Not position sensitive.
10. Shallow panel depth.
3⅛"
2¾"
2¾"
Patent Pending

Max. Volts	Full Load Amps.	Locked Rotor Amps.
250	25	150
600	12.5	75

ONLY RBM HAS ENGINEERED A COMPLETE FAMILY OF AIR CONDITIONING CONTROLS

TYPE C-30, C-40, C-50 CONTACTORS Write for Bulletin 1070

TYPE 80 CONTROLLER Write for Bulletin C-11

TYPE 75 POWER RELAY Write for Bulletin 1030.

SERIES 129000 SHUNT TYPE RELAY—SPNO, SPNC OR NO-NC Write for Bulletin 1010-A.

GENERAL PURPOSE RELAY Write for Bulletin 1060

SERIES 128000 POTENTIAL STARTING RELAYS Write for Bulletin 1010-A

BIMETAL TIME DELAY RELAYS AND THERMOSTATIC DEVICES Write for Bulletin C-15

ENCLOSED BANTAM RELAY TYPES 83 & 84 Write for Bulletin 1080

RBM CONTROLS DIVISION

ESSEX WIRE CORPORATION, LOGANSPORT, INDIANA

Factories Located at North Manchester and Logansport, Indiana

WHEN YOU ARE READY TO

IMPROVE THE SALES APPEAL OF

YOUR PRODUCT THE NEXT STEP IS

activated charcoal

Check the applications you are interested in, clip this ad and mail it to us.

- ☐ Air conditioners
- ☐ Furnaces
- ☐ Portable air purifiers
- ☐ Air coolers
- ☐ Ductless kitchen hoods
- ☐ Refrigerators
- ☐ Dehumidifiers
- ☐ Freezers
- ☐ Your product?.....

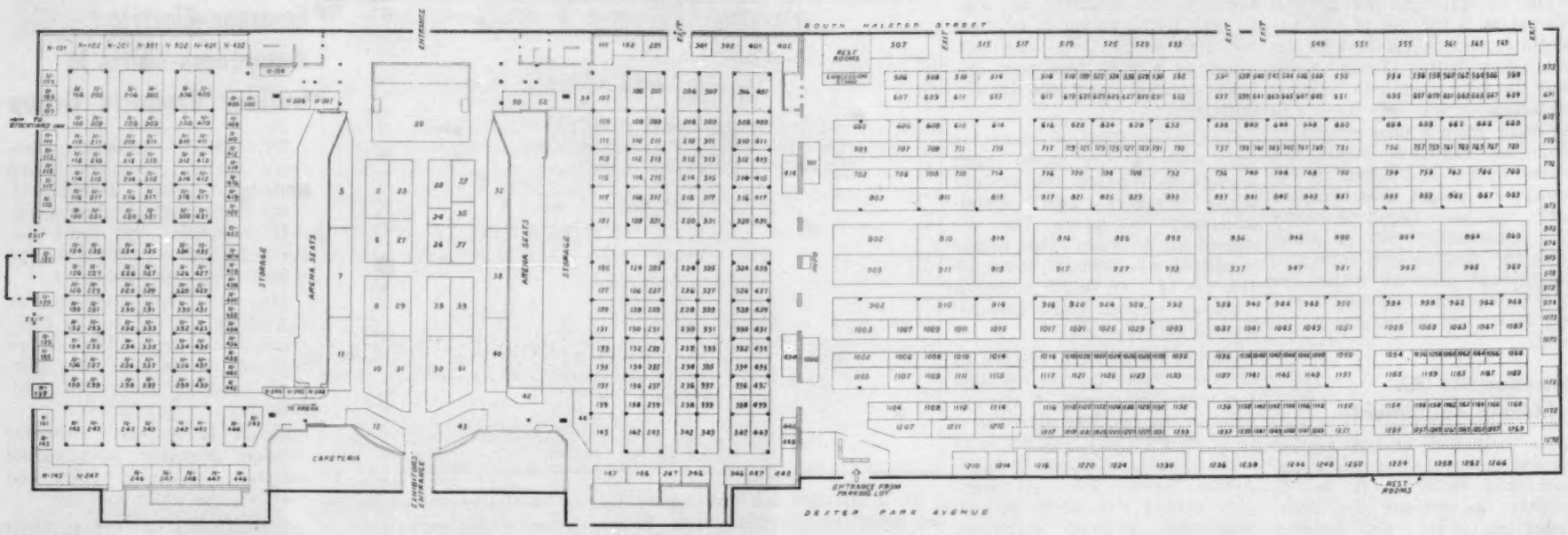
Built-in air purification with activated charcoal is the next step in improving the sales appeal of these and other appliances for home use. Activated charcoal removes odors by positive adsorption—and at low cost. It's been tested for years in submarines, gas masks and many industrial and public building installations.

Barnebey-Cheney designs and fabricates all types of activated charcoal filters, both reusable and throw-away; supplies a complete line of activated charcoals for every purpose.

Barnebey-Cheney, Columbus 19, Ohio.

BOOTH 1111 - Chicago Exposition - February 13-16

Barnebey Cheney



Companies Exhibiting at Heating, Air Conditioning Show

COMPANY	BOOTH(S) NUMBER
A	
Ace Engineering Co.	936
Ackerman Gas Boiler Corp.	N-134
Acme Engineering & Mfg. Corp.	1133
Acme Industries, Inc.	854, 864
Addison Products Co.	1110, 1114
Aeronautical Electronics, Inc.	214
Aeroquip Corp.	120
Air-con Filter Corp.	N-422
Air Conditioning Equipment Corp.	1103
Air Conditioning, Heating & Refrigeration News	342
Air Control Products, Inc.	407
Air Devices Inc.	1015
Air Engineering	342
Air-Heet Corp.	1020
Air Motion Research Div. Missile Dynamics Corp.	N-247
Airfan Engineering Co.	N-312, N-314
Airfloor Co. of Calif., Inc.	1128
Airserco Mfg. Co.	1145
Airtemp Div., Chrysler Corp.	1159-1169
Airtex Corp.	217
Ajax Boiler & Heater Co.	1058, 1060
Albion Div., McGraw-Edison Co.	335, 337
Alco Valve Co.	932
Aldrich Co.	1051
Allen-Bradley Co.	556, 558, 560
Allis Co.	1049
Alnor Instrument Co., Div. of Illinois Testing Lab., Inc.	672
Aluminum Co. of America	765, 767
American Air Filter Co., Inc.	40
American Coolair Corp.	1038, 1040
American Engineering Co.	54
American Furnace Co.	N-315, N-317, N-321
American Gas Assn.	526-532 & 633
American Gilsonite Co.	841
American Iron and Steel Institute Committee of Steel Pipe Producers	709
American Pullmax Co., Inc.	N-320
American Society of Heating, Refrigeration & Air-Conditioning Engineers, Inc.	701
American-Standard Air Conditioning Div.	26
Detroit Controls Div.	24, 106
Industrial Div.	20, 22
Plumbing & Heating Div.	23, 27
American Tube & Controls, Inc.	N-112
American Warming & Ventilating Co., The	650
Ammerman Co., Inc.	429
Anderson Co., The, V. D., Div. of International Basic Economy Corp.	1018
Anemostat-Waterloo	29
Ansul Chemical Co.	966
Apexiro Products Co.	N-434
Argo Industries, Inc.	N-130, N-132
Arkla Air Conditioning Corp.	526-532
Arklon Products Co.	766
Arkos Mfg. Co., Div. Arnold A. Korsarin & Associates, Inc.	N-108
Armco Steel Corp.	1207
Armstrong Cork Co.	1042, 1044
Armstrong Furnace Co., Div. of National Union Electric Corp.	6
Armstrong Machine Works	625, 627
Armstrong Steam Trap Co.	625, 627
Arrow-Hart & Hegeman Electric Co., The	663, 665
Arvin Industries, Inc.	N-230, N-232
Ascot Gas Water Heaters Inc.	N-440
Associated Laboratories, Inc.	N-126
Auer Register Co., The	1009
Aurora Pump Div., The New York Air Brake Co.	568
Au-Temp Co., Corp. Div. of Heat-Timer Corp.	425
Auto-Flo Corp.	302, 401
Automatic Devices Div., American Machine & Metals, Inc.	N-504
Automatic Humidifier Div., Standard Mfg. Co.	N-129
Avon Tube Div., Higbie Mfg. Co.	N-337
B	
Bacharach Industrial Instrument Co.	1024
Baltimore Aircoil Co., Inc.	39
Barber-Colman Co., Air Distribution Products Div., Automatic Controls Div.	506, 508
Barke Products, Inc.	446
Barnebey-Cheney Co.	1111
Barry Blower Co.	720
Baso Inc.	851
Bastian-Morley Co., Inc.	N-342
Bayley Blower Co., Div. of The Green Fuel Economizer Co., Inc.	1104
Bell & Gossett Co.	911
Bendix-Westinghouse Automotive Air Brake Co.	309, 311
Bettcher Mfg. Co., The, Panelblock Div.	1223, 1225
Binks Mfg. Co.	1062, 1064
Birchfield Boiler, Inc.	N-347
Bloomer Cooling Tower Div., Fiske Co.	N-335
Bohn Aluminum & Brass Corp., Danville Div.	606
Boiler Equipment Trust	N-117
Bootz Mfg. Co., Inc.	232
Boyle Engineering Laboratory	745
Brandes Co.	763
Breidert Co., The G. C.	N-229
Brookside Corp.	52
Brown Products Corp., A.	729
Browning Mfg. Co.	607
Brundage Co., The	609, 611
Bryan Steam Corp.	N-138
Buensod-Stacey Corp.	N-444
Buffalo Forge Co.	832, 933
Burgess-Manning Co., Architectural Products Div.	313, 315
Burke & Co.	N-143
Burnham Corp. Heating & Cooling Div.	714
Steel Boiler Dept.	708, 710
Warm Air & Cooling Div.	706, 708
C	
CBS Industries Inc.	327
Calgon Co., Div. of Hagan Chemicals & Controls, Inc.	755
Cambridge Filter Corp.	914
Cargocaire Engineering Corp.	N-343
Carnes Corp.	940
Carrier Air Conditioning Co.	549-569
Cash Valve Mfg. Corp.	707
Caterpillar Tractor Co.	524
Century Electric Co.	915
Century Engineering Corp.	962
Chace Co., W. M.	1030
Champion Blower & Forge Co., Inc.	651
Chatleff Controls, Inc.	N-415
Chicago Blower Corp.	602, 703
Chicago Pump, Hydrodynamics Div., Food Machinery & Chemical Corp.	31
Chicago Steel Furnace Co.	649
Chicago Stock Yards Turbo Refrigerating Co.	N-325, N-327
Chrysler Corp., Airtemp Div.	1159-1169
Clarage Fan Co.	810
Cleaver-Brooks Co.	33
Cleveland Controls, Inc.	1221
Cleveland Steel Products Corp., Toridheet Div.	724, 728
Cobra Metal Hose Div., D. K. Mfg. Co.	1026, 1028
Coleman Co., Inc., The	1245, 1247, 1249
Columbia Boiler Co. of Pottstown	655
Combustion Control Div., Electronics Corp. of America	12
Commercial Filters Corp.	411
Condensation Engineering Corp.	N-421
Connor Engineering Corp.	142
Continental Air Filters, Inc.	1033
Continental Automatic Boiler Div. of Boiler Engrg. & Supply Co., Inc.	N-443
Continental Mfg. Co.	1173
Controls Co. of American, Htg. & Air Conditioning Div.	803
Cook Co., Loren	644
Cool Heat Div. of Drying Systems Co.	N-242
Copeland Refrigeration Corp.	515, 517
Crane Co., Plumbing—Heating—Air Conditioning Group	825, 826, 829 924, 927, 928
Curtis Mfg. Co., Refrigeration Div.	850, 951
Cutler-Hammer, Inc.	1155
D	
Danfoss Inc.	135, 137, 139
Dekoron Products Div., Samuel Moore & Co.	N-124
Delavan Mfg. Co.	1021
Delco Appliance Div., General Motors Corp.	N-330, N-332
Delco Products Div. of GMC	N-145
Detroit Controls Div., American-Standard	24, 106
Diehl Mfg. Co.	N-433
Doerr Electric Corp.	572
Dole Refrigerating Co.	328
Dongan Electric Mfg. Co.	N-111
Dornback Furnace & Foundry Co.	N-239
Dornback Industries	N-239
Dravo Corp.	1258-1262
Drayer-Hanson Div. of Hi-Press Air Conditioning of America, Inc.	1172
Dryer Dynamics Corp.	107
Dryomatic Corp.	210
Dunham-Bush, Inc.	32
Du Pont de Nemours & Co., Inc., E. I., "Freon" Products Div.	1211
Dura-Vent Corp.	243
Duro-Dyne Corp.	772-773
Dwyer Mfg. Co., F. W.	1016
E	
Econo Products Co., Inc.	1266
Edwards Engineering Corp.	624, 628
Electric Boat Div., General Dynamics Corp.	132, 134
Electro-Air Cleaner Co., Inc.	815
Electro Dynamic Div. of General Dynamics Corp.	136
Electromode, Div. of Commercial Controls Corp.	413, 415
Electronics Corp. of America, Combustion Control Div.	12
Elgen Mfg. Corp.	645, 647
Emerson Electric Mfg. Co., The	542-548
Engel Sheet Metal Equipment, Inc.	101, 102, 201
Engineers' Product File	N-414, N-416
Essex Wire Corp., R-B-M Controls Div.	1156
Excelsior Steel Furnace Co., The	N-324
F	
Fairbanks, Morse & Co., Electrical Div.	213, 215
Farr Co.	10
Fasco Industries, Inc.	737
Fedders Corp., Trenton Div.	702
Federal Boiler Co., Inc.	11
Fee & Mason Mfg. Co., Inc.	717
Felter Co., John	N-505
Field Control Div., Conco Engineering Works, Inc.	732
Fiske Co., Bloomer Cooling Tower Div.	N-335
Flanders Filters, Inc.	536
Flexible Tubing Corp.	320
Flexonics Corp., Subsidiary of Calumet & Hecla, Inc.	538, 540
Food Machinery & Chemical Corp., Peerless Pump, Hydrodynamics Div.	1272
Forest City Foundries Co., The, Niagara Furnace Div.	N-506
Fram Aire Corp., Div. of Fram Corp.	869
Frick Co.	1115
Fulton Sylphon Div., Robertshaw-Fulton Controls Co.	228, 230
Furnas Electric Co.	1146, 1148
G	
Gallagher Co., The	562, 564
General Air Products Corp.	754
General Automatic Products Corp.	121
General Blower Co.	1045
General Chemical Div., Allied Chemical Corp.	43

These 2 Krack 15-ton Remote Type Air Cooled Condensers at the Safeway Supermarket in Oklahoma City, condense Freon-12 refrigerant for 15 compressors serving food sales cases, display cases, and walk-in service rooms.
KRACK
SAFEWAY

"We chose Krack Air Cooled Condensers for Safeway because of full rated-capacity performance, low cost, and better delivery."

—L. C. Nettleship, Jones-Newby Supply Co., Oklahoma City

Count on KRACK to Deliver RATED CAPACITIES

YOU ENJOY THESE ADVANTAGES:

Equipment matches the job . . . You can be *sure* about actual performance. You don't have to "play it safe" by specifying more costly, "oversize" equipment for a job when it is not needed.

Gain advantages of lower bidding . . . By saving cost of specifying "oversize" equipment to compensate for uncertain performance, you can bid lower and win more jobs.

Save installation and maintenance headaches . . . With Krack job-rated equipment, installations go more smoothly. Costly service calls for repairs and adjustments are rare. A good way to retain priceless customer good will.

No service calls with Krack Air Cooled Condensers—Eliminate maintenance problems . . . forget about down time for draining, scale removal and periodic overhauls. No water is required. Destructive corrosive action from water is gone and so are costly callbacks.

KRACK REFRIGERATION APPLIANCES, INC.

Manufacturers of Freon or Ammonia, Recirculated, Flooded or Direct Expansion Heat Transfer Equipment

MAIL COUPON FOR FREE BULLETIN AC-457

REFRIGERATION APPLIANCES, Inc., 901 W. Lake St., Chicago 7, Ill.

Name_____

Firm_____

Street_____ City_____ Zone____ State_____

0239

COMPANY	BOOTH(S) NUMBER
General Controls Co.	314
General Dynamics Corp. Electric Boat Div.	132, 134
Electro Dynamic Div.	136
General Electric Co., Apparatus Sales Div.	736, 740, 744
General Filters, Inc.	762
General Heating Products Co.	414
General Products Co., Inc.	N-338
General Thermo Electric Corp.	N-346
Goodfellow Co., Inc., E. D.	1269
Gordon & Piatt, Inc.	N-543
Governair Corp.	507
Grayson Controls Div., Robertshaw-Fulton Controls Co.	228, 230
Greenheck Fan & Ventilator Corp.	310
Gulf Oil Corp.	N-334, N-336
Gustin-Bacon Mfg. Co.	50
H	
H & H Tube Mfg. Co.	1238
Halstead & Mitchell	N-217
Hammond Valve Corp.	747
Harris & Co., Arthur	721
Hart & Cooley Mfg. Co.	1136
Harvey, Inc., Sid	334
Hastings Air Control, Inc.	863, 867
Hays Mfg. Co., Automatic Controls Div.	1129
Heat Controller, Inc.	629, 631
Heat-Timer Corp.	425
Heil Process Equipment Corp.	N-442
Heil-Quaker Corp.	129, 131
Hendricks Supply & Mfg. Co., Inc.	247
Henry Furnace Co., The	30,41
Henry Valve Co.	1217, 1219
Hercules Chemical Co., Inc.	N-346
Herrmidifier Co.	127
Highside Chemicals Inc.	972, 974
Hild Floor Machine Co., Inc.	N-418
Hiliti, Inc.	N-431
Hi-Press Air Conditioning of America, Inc.	1172
Howell Electric Motors Co.	1160, 1162, 1164
Hubbell Corp.	711
Hydrotherm, Inc.	667, 669
I	
Ilg Electric Ventilating Co.	1037, 1041
Illinois Engineering Div. of American Air Filter Co., Inc.	40
Illinois Iron & Bolt Co., Freeman Heating Div., Automatic Solid Fuels Div.	306
Illinois Testing Laboratories, Inc., Alnor Instrument Div.	672
Imperial Brass Mfg. Co., The	N-228
Imperial Damper Co.	N-328
Independent Register Co., The	739
Industrial Acoustics Co., Inc.	1103
Industrial Combustion, Inc.	28
Industrial Engineering & Equipment Co.	N-438
Industrial Plastic Fabricators Inc.	116
Ingersoll-Rand Co.	659, 661
Insto-Gas Corp.	1022
International Heater Co.	811
International Mfg. Co., Air Conditioning Div.	554
Iron Fireman Mfg. Co.	950, 1106
Isoflex Sales Co.	727
J	
Jackes-Evans Mfg. Co.	N-227
Janitrol Heating & Air Conditioning Div., Midland-Ross Corp.	519-533
Jenkins Bros.	1230
Jenn Air Products Co., Inc.	833
Jet-Heet, Inc.	N-313
Johns-Manville Sales Corp.	447, 448
Johnson Co., S. T.	N-446, N-447
Johnson Furnace Co., The	N-406
Johnson Heater Corp.	321
Johnson Service Co.	836, 937
Johnston Bros., Inc.	402
K	
K S M Products, Inc.	N-343
Kaiser Aluminum & Chemical Corp.	1010
Kenmore Machine Products, Inc.	1236
Kennard Div. of American Air Filter Co., Inc.	40
Kimberly-Stevens Corp.	N-326
Kingston-Conley Inc.	1160, 1162, 1164
Koppers Co., Inc., Metal Products Div.	242
Korfund Co., Inc., The	42
Koven & Brother, Inc., L. O.	143
Kresno Stamm Corp.	N-333
Kritzer Products, Div. of Peerless of America, Inc.	1137
Krueger Air Conditioning Co.	312, 314, 316
L	
Lake Chemical Co.	237, 239
Lambert Industries, Inc.	1124, 1126
Larkin Coils, Inc.	326
Lau Blower Co., The	910
Laurel Products, Inc.	212
Lawler Automatic Controls, Inc.	719
Lesce-Neville Co., The, Georgia Div.	N-231
Lehigh Fan & Blower Div., Fuller Co.	1239, 1241
Leland Ohio Electric Co.	1160, 1162, 1164
Lennox Industries, Inc.	N-206 to N-216 & N-305
Lennox Tool & Machine Builders	1166
Leslie Welding Co., Inc.	N-544
Lewin-Mathes Co., Div. of Cerro Corp.	434
Liberty Combustion Corp.	N-133
Lima Register Co.	1168
Little Burner Co., H. C.	N-342
Lockformer Co., The	837
Mc	
McAlear Mfg. Co.	748
McDonnell & Miller, Inc.	1000
McGraw-Edison Co., Albion Div.	335, 337
McIntire Co., The	317
McLarty Systems	N-135
McQuay, Inc.	802
McQuay-Norris Mfg. Co.	N-316
M	
Magnetrol, Inc.	1036
Maid-O'-Mist, Inc.	346
Major Controls Co.	1118
Mamco Corp.	N-221
Mammoth Industries, Inc.	917
Maplewood Div., Rockford Machine Tool Co.	N-142
Marathon Electric Mfg. Corp.	1151
Markal Co.	237, 239
Marley Co., The	616, 620
Marlo Coil Co.	1215
Marsh Instrument Co., Div. of Colorado Oil & Gas Corp.	639, 641, 643
Mastercraft Industries, Inc.	N-436
Maxitrol Co.	916, 920
Mechanical Contractors Supply Co., Inc.	N-323
Meier Div. of The Lau Blower Co.	44
Melchior, Armstrong, Dessau, Inc.	N-224, N-226
Mercoid Corp., The	35
Metalbestos Div., William Wallace Co.	408
Mid-Continental Metal Products Co.	1116
Midland-Ross Corp., Janitrol Heating & Air Conditioning Div.	519-533
Milwaukee Electric Tool Corp.	1158
Milwaukee Valve Co.	227
Mine Safety Appliances Co.	147
Minneapolis-Honeywell Regulator Co.	965, 969
Mission Mfg. Co.	1048
Modern Flo-Trol Products Corp.	741, 743
Modine Mfg. Co.	632
Monarch Mfg. Works, Inc.	1050
Monogram Industries, Inc.	146
Moore & Co., Samuel, Dekoron Products Div.	N-124
Mt. Hawley Mfg. Co.	N-235
Mueller Brass Co.	845, 849
Mueller Climatrol Div. of Worthington Corp.	1055, 1059
Multi-Vent Div., The Pyle-National Co.	566
N	
NRC Equipment Corp.	114
National Heater Co., Inc.	1250
Needco Group of Companies	N-246
Nelson Div., Herman, of American Air Filter Co., Inc.	40
New York Blower Co., The	816
Niagara Furnace Div., The Forest City Foundries Co.	N-506
Niagara Machine & Tool Works	817, 821
O	
Octagon Ventilator Mfg. Co.	N-432
Ohio Electric Mfg. Co.	1160, 1162, 1164
Oil Equipment Mfg. Corp.	N-417
Olsen Mfg. Co., The C. A.	30, 41
Omark Industries, Inc.	108, 110
Orr & Sembower, Inc.	207
Oster Mfg. Co., The	1233
Owens-Corning Fiberglas Corp.	654
P	
Paragon Electric Co.	757
Parker Boiler Mfg. Co., Inc.	N-225
Peerless of America, Inc.	1141
Peerless Corp., The	8
Peerless Electric Div., H. K. Porter Co., Inc.	206
Peerless Heater Co., The	1072, 1073
Peerless Mfg. Div. of Dover Corp.	243
Peerless Pump, Hydrodynamics Div., Food Machinery & Chemical Corp.	1272
Pelna Engineering Corp.	N-426
Penn Controls, Inc.	N-234, N-236, N-238
Penn Ventilator Co., Inc.	338
Pennsalt Chemicals Corp. Isotron Div.	209, 211
Pennsylvania Furnace & Iron Co.	128, 130
Perfection Div., Hupp Corp.	1002
Permalife Glass Fiber Div., Standard Electric Co.	N-141
Perolin Co., Inc., The	518
Petro	325
Pioneer Products Div., Witco Chemicals Co., Inc.	N-114
Pittsburgh Corning Corp.	N-128
Pittsburgh Plate Glass Co., Fiber Glass Div.	125
Plan Hold Corp.	112
Port City Machine & Tool Co., Mipatan Div.	N-420
Power Flame Div., Inc., Siemon Mfg. Co.	1120, 1122
Power Line Fan Co., Div. of Chelsea Products, Inc.	637
Powers Regulator Co., The	872, 873
Purolator Products, Inc.	117
Pyle-National Co., The, Multi-Vent Div.	566
Q	
Quickdraft Corp., The	443
R	
R-B-M Controls Div., Essex Wire Corp.	1156
Radio Central Co.	214
Radio Corp. of America	417
Ramset Fastening System, Winchester-Western Div., Olin Mathieson Chemical Corp.	220
Ranco Inc.	855
Randall Graphite Bearings, Inc.	1007
Ray Oil Burner Co.	229, 231
Raypak Co., Inc.	N-425
Ready Power Co., The	633
Reed Unit Fans, Inc.	216
Refrigeration Research	N-306
Republic Products Co.	414
Research Products Corp.	1017
Revcor, Inc.	1068
Rheem Mfg. Co.	662, 666
Ric-wil Inc.	516
Ridge Tool Co., The	636, 640
Roberts-Gordon Appliance Corp.	1231
Robertshaw-Fulton Controls Co., Fulton Sylphon Div., Grayson Controls Div.	228, 230
Robertson Co., H. H.	301
Robinair Mfg. Corp.	N-233
Roth Co., Roy E., Turbin Pump Div.	859
Rotherm Engineering Co., Inc.	745
Royal Mfg. Co.	N-437
Rubatex Div., Great American Industries, Inc.	N-209
S	
S.O.S. Products Co., Inc.	N-125
Safeguard Corp.	N-107
Sarco Co., Inc.	615
Sarcotherm Controls, Inc.	615
Schemenauer Mfg. Co.	1263, 1265, 1267
Schnacke, Inc.	975
Seaboard Products Corp.	N-237
Senna Mfg. Co.	N-545
Shaw-Perkins Mfg. Co.	N-113, N-115
Shenango Refractories Div. of Shenango China, Inc.	N-412
Silvercote Products, Inc.	N-428
Skuttle Mfg. Co.	668
Slant/Fin Radiator Corp.	435, 437, 439
Smith Corp., O. A., Milwaukee, Wis.	1130, 1132
Smith Corp., O. A., Kankakee, Ill.	522
Smith Co., The H. B.	614
"Snappy", Inc.	246
Southwest Mfg. Co.	608, 610
Spartan Convector Co., Inc.	308
Spiro U.S.A., Inc.	N-205
Sporlan Valve Co.	1254
Sprague Electric Co.	1227, 1229
Spraying Systems Co.	758
Square D Co.	510
Standard Instrument Corp., Div. of Heat-Timer Corp.	425
Standard Refrigeration Co.	307
Standard Stamping & Perforating Co.	1054
Stanley Electric Tools Div. of the Stanley Works	N-435
Star Expansion Industries Corp.	208
Steinen Mfg. Co., Wm., Heating Products Div., Industrial Nozzle Div.	1244
Stephens-Adamson Mfg. Co.	133
Stewart-Warner Corp., Heating & Air Conditioning Div.	1150, 1251
Stoddard Industries, Inc.	427
Stokermatic Co., The	336
Strong, Carlisle & Hammond	748
Sundstrand Hydraulics Div. of Sundstrand Corp.	617, 619
Sun-Ray Burner Mfg. Corp.	715
Swartwout Fabricators Inc.	1014
Synchronous Flame, Inc.	N-103, N-105
T	
Taco Heaters, Inc.	1011
Tan Corp., Congress Drives Div., Tann Bearing Div.	N-427
Tecumseh Products Co.	339, 343
Televance Corp.	444
Temco, Inc.	621, 623
Thatcher Furnace Co.	1025, 1029
Thermac Co.	944
Thermal Engineering Corp.	194 & 225
Thermo-Pak Boilers, Inc.	N-429
Thermo-Products, Inc.	N-220
Thermotank, Inc., Air Products Div.	761
Thermowheel, Inc.	N-119
Thrush & Co., H. A.	733
Titus Mfg. Corp.	902
Tjernlund Mfg. Co.	N-211, N-213, N-215
Toledo Pipe Threading Machine Co., The	233
Toridheet Div., Cleveland Steel Products Corp.	724, 728
Torrington Mfg. Co., The	947
Trane Co., The	3, 7
Trorice Co., H. O.	N-408, N-410
Triangle Engineering Co.	N-505
Trion, Inc.	N-507
Triplex Heating Specialty Co., Inc., The	126
Tuttle & Bailey Div., Allied Thermal Corp.	768
Tuttle Electric Products, Inc.	N-339
Tuttle & Co., H. W.	671
Typhoon Air Conditioning Div., Hupp Corp.	234, 236, 238
U	
Union Carbide Development Co., Div. of Union Carbide Corp.	948
Union Damper Co., The	N-136
United Sheet Metal Co., Inc.	874, 973
United States Air Conditioning Corp.	648
United States Gypsum Co.	N-120
United States Register Co.	1032
Universal Diffuser Corp.	1149
V	
Van Dorn Iron Works Co., The, Infra-Red Div.	N-116
Van-Packer Co., Div. of The Flintkote Co.	N-424
Vapor Heating Corp.	331
Ventfabrics Inc.	421
Vernco Corp.	226
Vibration Eliminator Co., The	1259
Vibration Mountings, Inc.	668
Viking Air Products Div. of The Lau Blower Co.	N-409, N-411
Vilter Mfg. Co., The	339
Vulcan Radiator Co.	846
W	
W-M Mfg. Co.	N-413
Wagner Electric Corp.	1109
Walker Mfg. & Sales Corp.	N-306, N-310
Wallace Co., William, Metalbestos Div.	409
Walton Laboratories, Inc.	37
Walworth Co.	N-309
Warranty Service Co., Div. of Employers Insurance Service, Inc.	1046
Warren Engineering Co., Div. of Warren Automatic Controls Corp.	1243
Waterloo Register Co., Inc.	29
Waterman-Waterbury Co., The	234
Watts Regulator Co.	224
Waukesha Motor Co.	1125
Weatherhead Co., The, Fort Wayne Div.	769
Webster Electric Co.	1107
Webster & Co., Inc., Warren	1138-1144
Weil-McLain Co.	903
Weil Pump Co.	954, 958
Welbilt Air Conditioning & Heating Corp.	750
Welty-Way Products, Inc.	N-106
Western Boiler Co.	229, 231
Western Supply Co.	138
Westinghouse Electric Corp., Air Conditioning Div.	955
Motors and Control	2
Wheel Trueing Tool Co., Truco Masonry Drilling Div.	1255
White-Rodgers Co.	1117, 1121
Wiegand Co., Edwin L.	1237
Will-Burt Co., The	N-329, N-331
Williams Oil-O-Matic Heating Co., Div. of National Union Electric Co.	550
Williamson Co., The	109-115
Wilson Mfg. Co.	1056
Wing Mfg. Co., L. J., Div. of Aero Supply Mfg. Co., Inc.	1003
Wiremold Co., The	N-439
Witco Chemical Co., Inc., Pioneer Products Div.	N-114
Wolverine Tube Div. of Calumet & Hecla, Inc.	1154
Worley Equipment, Inc.	221
Worthington Corp.	1063, 1067, 1069
X	
XXth Century Heating & Ventilating Co., The	1006
Y	
Yeats Appliance Dolly Sales Co.	N-406
York Corp.	1210-1234
York-Shipley, Inc., General Div.	N-301
Industrial Div.	N-101, N-102, N-201
J & C Div.	N-401, N402
Residential Div.	N-302
Young Radiator Co.	514
Young Regulator Co.	716
Yuba Consolidated Industries, Inc.	330, 332, 431, 433

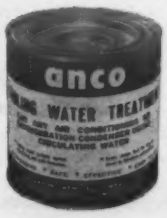
NEWS readers are invited to write to the editor giving their opinions on any subject of interest to the industry.

PREVENT SCALE
GIVE WATER
RUNNING ROOM

WITH anco
cooling water treatment

When rust, scale, and other deposits build up on heat-exchange surfaces in your cooling system, efficiency drops.

Anco Cooling Water Treatment keeps the water side clean and free of rust and scale. Circulating water has room to flow freely . . . metal surfaces are protected from destructive pitting. This protective compound is both convenient and easy to use . . . just place can(s) in condenser pan or tower basin where agitating water can gradually dissolve contents. One treatment will last for about a month. Ask your supplier about this economical protection for your cooling system, or write for literature.



CONDENSER CLEANER

Anco's dry formula is one of the most popular compounds for removing rust and scale deposits. It works while unit stays in operation. See for yourself how effective Anco Condenser Cleaner really is.

Specialists in making water behave

Anderson
Chemical Company, Inc.
Box 1424 • Macon, Georgia
Memphis, Tenn. • Box 2432 • DeSoto Station

ENGINEERED BY EDWARDS

AIRVEC
The completely silent Air Cooled Condenser
Never needs cleaning

WRITE FOR BULLETIN AV-4

WRITE FOR BULLETIN TT-653

WATER COOLED COAXIAL CONDENSERS
Domestic and sea water models
Reduce costs 40% . . . Reduce condenser water 35% . . . Reduce refrigerant charge . . . Stabilize capillary performance . . . Compact shapes.

MOTORIZED VALVES
For chilled water cooling systems and for heating systems . . . 100% positive shut-off . . . Compact . . . Low cost . . . Low Voltage . . . No current draw when open.

WRITE FOR BULLETIN MV-1

EDWARDS ENGINEERING CORP.
938-19 Alexander Ave., Pompton Plains, N. J.
TEmple 5-2808

One of the nation's largest manufacturers of Residential and Commercial Boilers, Baseboard and Steel-Fin Radiation, Motorized Valves, Air and Water Cooled Refrigerant Condensers

From the Manufacturers

Service Bulletins

In this department, the NEWS presents significant items from information published in the Service and Technical bulletins of manufacturers.

A problem familiar to the refrigeration industry is that of refrigerant condensing in the compressor crankcase and the absorption of the refrigerant in the oil. This causes severe slugging of the refrigerant-oil mixture as the pressure is rapidly reduced during startup. Frequently, compressor damage such as broken valves, damaged pistons, bearing failures due to serious loss of oil from the crankcase, bearing washout (refrigerant washing oil from bearings) is the result. In refrigeration systems this has been mainly a "cold weather problem" when the compressor was placed in an atmosphere having a temperature lower than that of the evaporator.

With remote type condensing units for air conditioning and heat pump applications this same condition exists even at relatively high ambient temperatures. With the increased use of this type equipment for residential air conditioning the problem has become serious. It has resulted in an excessive number of compressor failures, broken valves, blown gaskets, seized or worn bearings, broken rods, broken crankshafts, and broken lines. This condition is primarily beyond the control of the compressor manufacturer.

A well-designed, efficient compressor for refrigeration, air conditioning, and heat pump duty is primarily a vapor pump designed to handle a reasonable quantity of liquid refrigerant and oil. To design and build a pump to handle more liquid would require a serious compromise in one or more of the following: size, weight, capacity, efficiency, and noise, not to mention the all-important factor, cost.

Regardless of design there are limits to the amount of liquid a compressor can handle, and these limits depend on factors such as internal volume of the crankcase, total oil charge, amount of oil remaining in the crankcase, type of system and controls, and normal operating conditions (such as operating temperatures, and ambient temperatures).

Where trouble due to refrigerant migration is likely to occur it is most important to hold the refrigerant charge as low as reasonably possible by:

1. Using the smallest practical size tubing in the condensers, evaporators, and connecting lines and circuiting the entire system to maintain the highest refrigerant velocity possible without encountering excessive pressure drop. Receivers also should be kept reasonably small.

2. Not overcharging the system. Charge with the minimum amount of refrigerant for proper operation and very little if any more. Beware of bubbles showing in the sight glass caused by small liquid lines and low differential pressures. This leads to serious overcharging, with resulting refrigerant migration, slugging, and compressor damage, especially on heat pump systems.

Excessive oil in a system will increase the slugging hazard and will reduce its refrigerating capacity. **Keep the oil level at the center of the sight glass.**

An oil separator is advantageous by trapping a large portion of the oil pumped out of the crankcase and returning it directly to the crankcase thereby preventing bearing damage which might occur if the oil should be in the condenser, receiver, evaporator, and connecting lines for any long period of time.

It is desirable to use a pump down system where practical. This is highly recommended and preferred to other methods. If a pump down system is not used a crankcase heater probably will be desired and is highly recommended, but **will not always be** sufficient to eliminate slugging. **A crankcase heater is recommended on all heat pump systems regardless of the amount of refrigerant charge,** but it may not be necessary on self-contained, well controlled air conditioning and/or heat pump systems having small refrigerant charges.

COPELAND REFRIGERATION CORP.

Fred F. Moore, Jr. Elected to Kensico Vice Presidency

MT. KISCO, N. Y.—Fred F. Moore, Jr. has been elected vice president of the Kensico Tube Co., division of Robinson Technical Products, it was announced by Thomas Nast, division president.

F. F. Moore

Moore joined Kensico Tube a year ago, as general sales manager, and will continue to head this department of the copper tubing company.

Earlier, he had been in the sales organization of Wolverine Tube for 12 years, and was eastern district manager prior to joining Kensico.

STOP 3-phase motor burnouts with INHERENT PROTECTED OPEN MOTORS

Motor protection is built-in, tested, U/L *approved*. Self-protected against conditions that up to now have caused 3-phase open motor failures.

Cuts costs because machinery down-time is prevented, overload current relays and 3-pole magnetic contactors may be eliminated. As easy to install as ordinary motors. A product of *Kingston-Conley, Inc., Plainfield, N.J.* . . . A Howell subsidiary

A-2564A

HOWELL
electric motors company
Offices in principal cities . . . see YELLOW PAGES

TYPE 56

First choice of Manufacturers!

A condenser water regulator with a smashing success story! In three short years the Type 56 Condenser Water Regulator has soared to top choice of the industry—top choice of foremost manufacturers of refrigeration equipment, engineers, contractors, service men. Reasons? Just to mention a few:

Wide range—Instantly adjustable to either R-12 or R-22 without changing springs—by simply turning knurled cap. (Setting easily made tamper-proof when desirable.)

Fits in—Small, but plenty of capacity, smoothest modulation, remarkable flow characteristics.

Marsh quality throughout—Monel seat beads that minimize wire drawing; leak proof bellows; provision for manual flushing after installation. More efficiency; more range; more downright value! Bulletin gives full details.

Your wholesaler stocks it!

MARSH INSTRUMENT COMPANY
Dept. D Skokie, Illinois
Division of Colorado Oil & Gas Corporation
Marsh Instrument & Valve Co., (Canada) Ltd., 9407 163rd St., Edmonton, Alberta, Canada • Houston Branch Plant, 1121 Rothwell St., Sect. 15, Houston, Texas

MARSH *Refrigeration Instruments*
Gauges • Thermometers • Valves

Visit us at Booth 629-631
Air Conditioning, Heating & Ventilating Exposition
Chicago — Feb. 13-16

Comfort-Aire AIR CONDITIONING

Self Contained Air Conditioners

Four full capacity models of 2, 3, 4 and 5 h.p. for residential and commercial applications. Smart in appearance and design proven, they allow complete flexibility of installation. Large coil surfaces, bonderized cabinets, Tecumseh compressor, capillary system and other quality features provide a Comfort-Aire owner many years of quiet, dependable operation.

Remote Air Conditioners

Available in the same size range as self-contained models, the split systems offer a large choice of evaporator-blower units and coil sections. The compact, efficient matched compressor units feature oversized condensers, low velocity horizontal air flow and Tecumseh compressors. Comfort-Aire matched systems are easy to install, quiet in operation and weather proofed to provide years of trouble free performance.

Also Available in Heat Pump Models

Dehumidifiers - Portable Room Air Conditioners - Through-the-Wall Air Conditioners - Furnaces - Air Cooled Remote and Self Contained Air Conditioners - Air Cooled Remote and Self Contained Heat Pumps

HEAT CONTROLLER, INC.
1900 Wellworth Ave. Jackson, Mich.

COMPRESSOR DESIGNERS
ENGINEERS
MANUFACTURERS

KNOW YOUR PISTONS

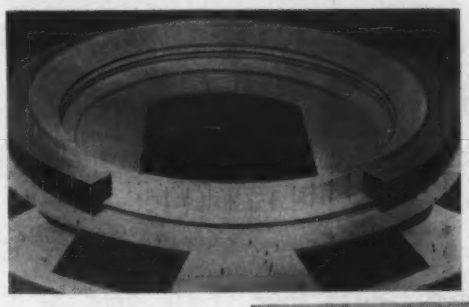
Did you know that Gillett & Eaton Vanasil pistons absorb oil to run with less friction? In addition to this hypereutectic aluminum alloy, G & E makes other aluminum, hi-tensile iron and bi-metal pistons in all sizes and shapes. Write for information on the performance you can expect from each type—specify your compressor use.

GILLETT & EATON, Inc.
861 Doughty Street, Lake City, Minn.

Sold in Canada by
Gould National Batteries of Canada, Ltd.
Fort Erie, Ontario

Piston and casting specialists

Established 1868



MODEL of proposed Houston Sports Stadium shows how seating would be arranged for football. 11,000 lower level seats move on rails to angular position for baseball.

SKETCH of stadium gives idea of tremendous size. Roof span is clear 640 ft reaching 200 ft height at center. Stadium will be completely air conditioned.

Houston Stadium--

(Continued from Page 1, Col. 3)

or a football gridiron, air conditioning engineers are facing some unique problems on an unprecedented scale.

The Houston sports stadium is expected to be ready for use by April, 1962, when the city's new major league baseball team makes its debut into the National League.

A circular structure, it will be approximately 745 ft in diameter. The domed roof will have a clear span of 640 ft with the highest portion some 200 ft above the center.

What are some of the air conditioning problems in what is expected to be the largest heated and air conditioned room in the world?

I. A. Naman, of I. A. Naman and D. S. Cooper Associated Engineers, who will do the mechanical engineering for the mammoth project, cited a few for the NEWS.

"Growing grass on the playing field has probably generated more complex engineering problems than any other phase of the design," he said.

To permit grass to grow the roof must be constructed of a transparent material which will admit sufficient sunlight for growth.

To provide enough translucent area for grass growth in the fall would result in an excessive area for heat gain in midsummer.

Consequently an ingenious system of louvering is being designed so that the translucent material will be partially shaded in the summer.

Another interesting problem involves the moisture given off by the growing grass. In a structure this size the moisture thus released would tend to form clouds in the vast dome and the stadium could conceivably have its own rain showers.

This can be prevented by intermittent use of the cooling system to control the interior humidity even when the building is not in use.

The cooling system itself will have a capacity of about 6,000 tons. It will utilize a number of centrifugal compressors which will chill water for circulation to various air handling units for cooling of the air in the structure.

It has not yet been determined whether or not the compressors will be powered by electric motors, gas turbines, or steam turbines. Economic studies are being made.

"To bring the concentration of smoke within acceptable limits," stated Naman, "we plan to pass all of the approximately 2,250,000 cfm through electrostatic precipitators."

It is also planned to use activated charcoal filters for odor removal. In spite of these measures it will still be necessary to introduce about 250,000 cfm of outside air and exhaust it from the top of the dome.

Two Houston architectural firms—Lloyd and Morgan and Wilson, Morris, Crain and Anderson—are associated for the design of the stadium, it was pointed out.

WE EXPAND YOUR DOLLARS MIGHTILY

Sure, everybody likes to make a buck go farther. At the Harry Alter Co. we think our prices are *always low.* And everybody big or small, city or country, pays the same fair price. Our transportation allowance saves you even more money. (And if you pick up at one of our 6 counters, you still get this allowance.)

We're Real Specialists in

REFRIGERATION • AIR CONDITIONING • ELECTRIC MOTORS

SUPPLIES and PARTS

SAVE MONEY, time and effort by ordering from our new *Dependabook,* the most complete catalog of all. 248 pages. Over 10,000 items carried in stock. *Wholesale only.* Your orders filled really fast by mail, or they can be picked up at one of our six big warehouses.

Write on your letterhead for the 1960-61 DEPENDABOOK...
Also our monthly Flyer of surplus and close-out Bargains.

THE HARRY ALTER CO., INC.

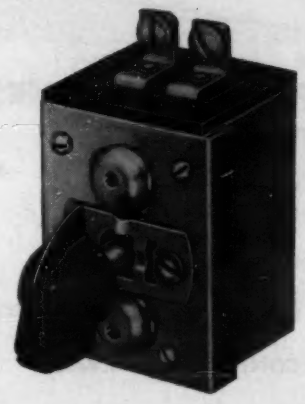
1717 S. Wabash Av. Chicago 16, Ill. | 134 Lafayette St. New York 13, N.Y. | 2332 Irving Blvd. Dallas 7, Texas | 695 Stewart Ave., S.W. Atlanta 10, Ga.

FREE PARKING AND FAST COUNTER SERVICE AT THESE 4 BIG WAREHOUSES

NEW WILCOLATOR TYPE G1

thermostat

HELPS YOU DESIGN MORE COMPACT HEATING CONTROLS



SINGLE-POLE, REMOTE-BULB UNIT COMBINES SMALL SIZE, HIGH CAPACITY, LOW COST

Photo courtesy Electromode Division of Commercial Controls Corporation

Combination of small size and high capacity offered by new Wilcolator G1 Thermostat is used to advantage in compact control panel of Electromode baseboard heater.

Because of its improved-design, snap-action switch mechanism, the new Wilcolator Type G1 Thermostat provides significantly higher contact ratings than were previously available in such a compact unit (2¾ x 1⅝ x 1⅞ in.). Thus you can utilize this new thermostat to design smaller, more efficient control panel assemblies for space heaters, ranges and similar appliances. At the same time, you can also reduce costs, because the G1 is generally priced lower than its bulkier counterparts.

The Wilcolator G1 Thermostat gives you accurate temperature control of practically any electrically heated medium—liquid, solid or gas—from 0 to 585°F. Its contacts are vibration proof and will not cause radio or TV interference. Temperature differential is adjustable and can be factory set to your specifications. Switch mechanism includes positive Off position.

For further information, write The Wilcolator Company, 1001 Newark Ave., Elizabeth, N.J. *In Canada:* Wilcolator (Canada) Ltd., 221 Evans Ave., Toronto 14, Ont.

SPECIFICATIONS

Temperature ranges: 0°F min.; 585°F max. Special temperature ranges: to customer's requirements

Contact rating: 30 amp, 125 and 250 volts a-c noninductive load

Standard shaft: ¼ in. diam. flatted to .156 in. Length to customer's requirements. Special shafts available

Dials: Standard or special dials, pointers, and chrome bezels available

Terminals: Screw type, AMP or Arkles

THE Wilcolator COMPANY

THE WILCOLATOR COMPANY
1001 NEWARK AVE., ELIZABETH, N.J.
Subsidiaries and/or Affiliates in Canada, Great Britain, Italy, Western Germany, and Australia

NEMA

Template for Dual Duct Layouts Available

NEW YORK CITY—A template for dual duct air conditioning layouts is being offered to architects, engineers, and contractors by Buensod-Stacey Corp., a pioneer in the development of Dual Duct systems.

The template, made of a flexible, translucent plastic, has both ¼-in. and ⅛-in. scales.

The templates are available from all Buensod-Stacey sales representatives.

Airtemp Furnace Wins Award for Design

DAYTON — A gas-fired furnace introduced last spring has received a design award for Chrysler Corp.'s Airtemp Div.

The model 4110 Lo-boy was the only furnace selected for inclusion in *Industrial Design Magazine's* annual design review, it was noted.

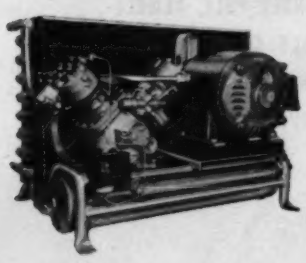
The Lo-boy has two front color panel inserts which permit individual color textural selections.

SUPERMARKET OWNERS GIVE FOUR REASONS FOR CHOOSING OPEN TYPE COMPRESSORS

In the first part of a study recently published by *Air Conditioning, Heating & Refrigeration News*, a 107-store supermarket chain revealed these reasons for preferring open type equipment:

- Much longer life
- Closer balance between high and low sides, with more satisfactory operating conditions
- More universal applicability—wide range of capacities; compressor displacement adaptable to new load conditions
- Unsurpassed service history according to actual records

FOUR REASONS WHY SUPERMARKET OWNERS CHOOSE LEHIGH OPEN TYPE EQUIPMENT



- LOW COST
- IMMEDIATE DELIVERY
- LONG-TERM DEPENDABILITY
- CONTINUOUS SERVICE

LEHIGH BLU-COLD COMPRESSORS AND CONDENSING UNITS
¼ H.P. to 7½ H.P. ■ AIR—AIR-WATER—WATER

Lehigh BLU-COLD

LEHIGH

LEHIGH MANUFACTURING COMPANY,
Division of Lehigh, Inc., Easton, Pa.
Manufacturers of Hermetic and Open Type Condensing Units; Compressors; Receivers; Condenser Receivers.

Save up to
25%
per installation with HOWELL
PART WINDING MOTORS

Why pay for unnecessary voltage-reducing motor-starter elements to limit inrush currents for low-starting-torque loads? Where your controller *doesn't need* transformers, resistors or reactors? . . . and requires only two half-size contactors?

You can save up to 25% when Howell *Part Winding Motors* go into your motor-control "package." You pay *little*, sometimes nothing more for the motor, you save a *lot* in control cost for jobs like these:

- Centrifugal pumps • Blowers
- Unloaded compressors • Fans
- *Any* low-starting-torque load

Call your HOWELL MAN for application counsel. A-3113A

- 10—300 hp. a.c.
- All enclosures
- All mountings
- All modifications
- NEMA designs B & C

Write for Bulletin 1030 (A, B)

HOWELL
electric motors company
Offices in principal cities . . . see YELLOW PAGES

American Danfoss Names T. H. Ford

LODI, N. J.—Appointment of Thomas H. Ford as executive vice president and general manager of Danfoss, Inc., was announced here recently.

T. H. Ford

Danfoss is a new American corporation which will supply equipment and controls for the air conditioning, heating, and refrigeration fields. It is a subsidiary of Danfoss of Denmark.

Ford most recently was assistant to the executive vice president of Fedders Corp.

Ford will be responsible for complete operation of the American Danfoss, which offers a full line of equipment and controls, "specifically designed and competitive in American markets." This equipment includes compressors, fuel pumps, and electrical starters. Control products include a full line of temperature and pressure devices such as expansion valves, solenoids, and thermostats.

Janitrol Factory Schools To Begin On Feb. 20

COLUMBUS, Ohio—A schedule of factory schools on Janitrol heating and summer air conditioning has been announced by H. C. Gurney, national sales manager, Janitrol Heating & Air Conditioning Div., Midland-Ross Corp.

Beginning Feb. 20, in the plant school room, 400 Dublin Ave., authorized Janitrol dealers and wholesaler representatives from throughout the nation will have an opportunity to study the technical aspects of heating and air conditioning. Servicing procedures will receive particular attention.

Dealers will work on "live" operating equipment, including newly-designed air cooled summer conditioning units and the company's latest developments in gas and oil-fired heating.

Detailed instruction by Janitrol design and field engineers will include a study of the electrical and mechanical controls of Janitrol cooling equipment, and practice in purging and charging air-cooled systems.

"Trouble-shooting sessions will be held on equipment which has been deliberately made to function improperly," it was pointed out. "This will be accomplished by the use of an ingenious control board which enables the instructor to create conditions that will actuate the safety controls and cause a service problem."

Week-long schools will be held Monday through Friday of the weeks beginning Feb. 20 and 27, March 6, 13, and 20, April 3, 10, 17, and 24, and May 1, 8, and 15. The heating and cooling schools will be alternated so those attending can cover the complete 1961 course in a two-week period.

Hupp 1960 Sales Hit $69.5 Million With Net Income of $1,005,000

CLEVELAND — Hupp Corp. registered 1960 sales of $69.5 million and net income of $1,005,000, after all charges, according to preliminary and unaudited financial reports, Don H. Gearheart, president, announced.

The 1960 sales level represented a decline of approximately 9% from the all-time high set in 1959, a result of "depressed markets in several areas of Hupp's operations," Gearheart said. In 1959, Hupp recorded sales of $76 million and net income after taxes of $2.1 million.

Gearheart cited "profit margins adversely affected by appliance industry over-production and resultant price pressures on these product lines" as a contributing factor in the earnings decline, over and above the decline in the general economy.

Hupp's financial condition was described as "the strongest in Hupp's 52 years of existence" by Gearheart. Total assets of $54.6 million and net worth of $30 million were all-time highs.

CLASSIFIED ADVERTISING

RATES for "Positions Wanted" $7.50 per insertion. Limit 50 words. 15¢ per word over 50.

RATES for all other classifications $10.00 per insertion. Limit 50 words. 20¢ per word over 50.

ADVERTISEMENTS set in usual classified style. Box addresses count as five words, other address by actual word count. Please send payment with order.

POSITIONS AVAILABLE

ENGINEER-SUPERVISOR: Expansion requires project engineer. Contracting firm, commercial, industrial air conditioning refrigeration. Complete, current experience required in design, contract expediting and field supervision. Engineering background—prefer minimum 7 years' experience. Send resume and starting salary requirements: D. B. Ervin, AIR CONDITIONING INC., 2001 Kettner Blvd., San Diego, Calif.

SALESMAN WANTED by air conditioning and refrigeration wholesaler of parts supplies and equipment to call on established customers. Excellent opportunity for experienced man with good references. Salary and bonus arrangement. Write or apply DAVEY SALES COMPANY, 468 E. Market Street, P. O. Box 449, Akron 9, Ohio.

SERVICEMAN: COMMERCIAL refrigeration and air conditioning mechanic needed. Guaranteed forty hours per week, year-round—no lay-offs. Paid vacations, other benefits. In letter state age, full experience, etc. Send picture. B. L. DAWSON AND COMPANY, 425 Clark Street, Middletown, Ohio.

PERFECTION, DIVISION of Hupp Corporation, due to expansion has openings for experienced heating and air conditioning district managers. This man must have a good knowledge of warm air heating, air conditioning and heat pumps. Experienced in sales to distributors. Anyone qualifying is invited to submit resume to PERFECTION, Division of Hupp Corporation, 1135 Ivanhoe Road, Cleveland 10, Ohio, or to personally contact P. H. GAUTHIER or C. W. MILLSOM at the Palmer House, or at Booth 1002 during the ASHRAE Show.

AMMONIA REFRIGERATION journeyman for established ammonia refrigeration contractor. Man to be capable of responsibility on installation jobs. U.A. wages and conditions, work in central California. Write to: REFRIGERATION & AIR CONDITIONING CONTRACTORS ASSOCIATION, 1521 T Street, Sacramento 14, California. Give details of experience and training.

EXCELLENT OPPORTUNITY for graduate engineer to join staff of long established heat transfer surface manufacturer. Must have minimum of three years' experience in design of air conditioning, refrigeration, heating components. Located in the South. Please submit complete resume with letter to BOX A6708, Air Conditioning, Heating & Refrigeration News.

WANTED REFRIGERATION and air conditioning service engineer. Heat pump and warm air heating experience given preference. Wonderful opportunity, retirement, hospital and medical benefits. Must be willing to travel. BOX A6719, Air Conditioning, Heating & Refrigeration News.

FIELD SERVICE engineer — Midwest manufacturer wants man fully experienced in application and service of residential air conditioners. Be able to perform heat gain surveys, duct-work sizing, and layouts. Engineering background important. Minimum of five years' experience as field service supervisor. Extensive travel required. Send resume with snapshot. State starting salary requirements. Replies confidential. Write BOX A6720, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT WANTED

USED AIR handling units for freezer with automatic defrost 150,000 to 200,000 Btu. Will consider complete system. Address replies to CAREY SALES & SERVICE, 3147 Frederick Avenue, Baltimore 29, Maryland.

CASH FOR Tecumseh compressors S 7R16, S 7N16, JE 300, FB 500, and other models. Advise B/M, electrical accessories, quantity, price. BOX A6722, Air Conditioning, Heating & Refrigeration News.

EQUIPMENT FOR SALE

BRAND NEW icemaker pump motor and impeller repair kits for Scotsman Carrier $18.00 at Kesco wholesalers coast to coast. Bronze replacement icemaker pumps for York Carrier $29.95. Hose connection adaptors for York Carrier $1.00. Complete line condensate pumps from 10" to 50" head, 115-208-230 volts. Catalog. KESCO, Jamaica 13, N. Y.

ATTENTION REFRIGERATION Servicemen. Send for catalog listing values in refrigeration and air conditioning parts, relays, capacitors, compressors. Savings up to 50%. WALTER W. STARR, 2833 Lincoln Ave., Chicago 13, Illinois.

AIRTEMP 15 ton water cooled air conditioner in original package. Never used. Model 1015, 208/220-3-60. Priced at $1,600.00, f.o.b. Sherman, Texas. WALSH ENGINNERING CO., P. O. Box 801, Sherman, Texas.

DOUBLE DOOR meters 400 international delinquent type. $5.00 each in lots of 100. $6.00 in lots of 10. $7.50 in single units. WATERS EQUIPMENT COMPANY, INC., P. O. Box 15157, Tampa 3, Florida.

TOOLS, DIES, molds and fixtures to manufacture complete line of room air conditioners in ¾, 1, 1½ and 2 h.p. for sale at fraction of original cost. Including engineering and technical data, blueprints for all purchase and manufactured parts, time studies, etc. BOX A6711, Air Conditioning, Heating & Refrigeration News.

BUSINESS OPPORTUNITIES

SEEKING AGGRESSIVE agents as manufacturers' representatives. Territories in Midwest, South ready for immediate development. Agents should be calling on air conditioning, heating distributors. In replying please describe territory, other lines handled. Our products form complete line of air conditioning chemical maintenance. WORTH CHEMICAL PRODUCTS COMPANY, Box 366, Fort Worth, Texas.

APPLIANCE STORE in sunny Southern California. Located in the center of a fast growing area. Well established. Major appliance and air conditioning franchises. Sales and service on air conditioning, heating, refrigeration and appliances. Selling due to illness. $6,000.00 includes truck and inventory. BOX A6721, Air Conditioning, Heating & Refrigeration News.

MISCELLANEOUS

ATTENTION—SERVICEMEN. Get the most complete catalog of Chicago replacement valve plates and shaft seals. Write or phone for catalog 809 and name of your nearest wholesaler. CHICAGO VALVE PLATE & SEAL COMPANY, 6960 W. Grand Avenue, Chicago 35, Illinois, Phone MErrimac 7-5666.

Heat Transfer Conference Set For Aug. 28

NEW YORK CITY — Plans for a five-day International Heat Transfer Conference, Aug. 28 to Sept. 1, 1961, at Boulder, Colo., have progressed so satisfactorily that the advance program will be available early in April, according to Dr. A. C. Mueller, chairman of the Joint Committee on North American Participation.

The conference, sponsored by four engineering societies, two American and two British, with participation by eight others, will be held on the campus of the University of Colorado.

Papers will be presented by engineers from the United States, Canada, England, U.S.S.R., Japan, Poland, Australia, France, Switzerland, Scotland, Sweden, Germany, and Yugoslavia.

Dr. Mueller also noted that over 100 papers on recent original work and new applications in heat transfer theory and practice will be reviewed by reporters and discussion of the papers will be emphasized. In addition, four lectures will review and synthesize recent developments in research and application.

Registration information and advance programs may be obtained by writing to The American Society of Mechanical Engineers, Meetings Dept., 29 W. 39th St., New York 18, N. Y.

A special feature of the conference will be talks by four visiting lecturers—Prof. E. R. G. Eckert of the University of Minnesota, Prof. H. C. Hottel of Massachusetts Institute of Technology, Prof. O. A. Saunders of Imperial college, London, England, and Prof. Ernest Schmidt of The School for Technical Thermodynamics, Munich, Germany.

Britain is represented by the Institution of Mechanical Engineers and the Institution of Chemical Engineers. Sponsors and co-hosts of the conference in the U. S. are The American Society of Mechanical Engineers and American Institute of Chemical Engineers. Among participants is the American Society of Heating, Refrigerating & Air-Conditioning Engineers.

'Comfort-Aire' Trademark Registration Complete, Heat Controller Says

JACKSON, Mich. — Complete Federal and state registrations of the "Comfort-Aire" trademark have been completed on the firm's products, according to J. A. Knight, president of Heat Controller, Inc.

He said the registrations apply to dehumidifiers, humidifiers, air conditioners, furnaces, heat pumps, and other general trade-mark categories.

The company plans to continue to vigorously promote "Comfort-Aire" in trade and consumer advertising, the announcement said, adding that trade-mark clarification of the southeastern states is now complete.

Table of Average Labor Costs for 1960 Being Revised by Southern Calif. Group

LOS ANGELES—A committee of Refrigeration & Air Conditioning Contractors Association of Southern California, Inc. is working on a revision of its "Cost Analysis Chart for One Hour of Service and/or Construction Work" in the light of current experience of the individual members.

In the cost analysis chart reported out in 1960, the following proved to be the average breakdown of costs:

DIRECT COSTS	Hourly Cost
Labor	
Hourly wage (plus fringes)	4.67
Social Security	.06
Unemployment Insurance	.03
Workmen's Compensation	.05
Truck Expense	
(Includes: Depreciation, Maintenance & Repairs, Oil & Gas, Insurance, Garage Parking)	1.00
Lost Time	
Call backs, stand-by, etc.	.18
Overhead	
Supervision (average 1 super to 5 journeymen. Includes: Dispatcher, Clerical, Payroll billings, etc., Executive salary or time value)	1.00
Bonuses and commissions	.05
Telephone (incl. proxy), utilities	.25
Rent or rental value of property owned	.02
Uniforms	.025
Office Supplies	.02
Auditing, legal	.02
Advertising	.01
Office Equipment, depreciation and repairs	.01
Credit losses	.01
Insurance: fire, theft, liability	.01
Taxes: city and county property tax	.01
Licenses: city, county, and state	.01
Dues to association	.01
Donations	.01
Interest on money invested in business	.03
Miscellaneous	.10
Operating supplies	.05
TOTAL DIRECT & OVERHEAD COST	7.635
Normal 10% profit	.763
	8.398
TRUCK CHARGE—to include use of miscellaneous items normally stocked on truck but not charged to customer, such as small amount of welding supplies, rags, thermometers, flash light supplies, oil, grease, etc.	$2.00-$3.00

AMCA Announces Revised Standard Code for Testing Propeller-Type Steam Unit Heaters

DETROIT — AMCA Bulletin No. 20—a new standard code for testing propeller-type steam unit heaters — has been announced by the Air Moving & Conditioning Association, Inc.

The revised code supersedes Bulletin 10, and is available for distribution to specifying engineers, consultants, testing laboratories, plant engineers, and other commercial and industrial users.

"Bulletin 20 establishes uniform methods for conducting tests on steam unit heaters which utilize dry steam as the heating medium, and serves as a standard for developing performance ratings under the AMCA Certified Ratings Program," the association pointed out.

"Included are definitions, descriptions of testing apparatus, instructions, and formulae for computing results and ratings. The code also incorporates new and improved test procedures, techniques and equipment, and has been simplified to eliminate the free air test and the requirement for chamber calibration."

Copies of Bulletin 20 may be obtained from the Air Moving & Conditioning Association's national headquarters, 2159 Guardian Building, Detroit 26, Mich.

TEST PROMOTION of General Electric central air conditioning through grocery chains was so successful in initial try-out in Houston, Texas, that the plan is presently under way in half a dozen other locations across the country. Pictured are four-color ad and promotional material used by A&P in Houston in the G-E "Supermarket Sweepstakes" contest which they co-sponsored recently. Contest prizes include a central air conditioning system installed in the winner's home as grand prize. The promotion is reported to have netted 1,500 requests for air conditioning surveys and estimates for participating G-E dealers in the first week.

STOP
SCALE
CORROSION
ALGAE
SLIME
with S-K ASSURED PREVENTIVE MAINTENANCE
Where scale, corrosion, algae and slime are day-to-day problems . . . with Stiles-Karlsonite products for *assured preventive maintenance* . . . you'll increase the overall efficiency of all your equipment . . . reducing operating costs.
Through Karlsonite—a low cost efficient water conditioner—elements in water that prove harmful and damaging to equipment are suspended and inactivated. You get crystal clear . . . non-corrosive . . . non-clogging . . . non-precipitating water . . . *always* at lowest cost!
Write today for new 24-page brochure . . . with the full story:
STILES-KARLSONITE CORPORATION
DEPT. SKA WAUKEGAN, ILLINOIS

AGENTS WANTED
BY
GOVERNAIR CORPORATION
See W. L. Hunt
BOOTH 507
HEATING & AIR CONDITIONING EXPOSITION

LATENT HEAT STORAGE FOR AIR CONDITIONING
• CHURCHES • MORTUARIES
• THEATRES • OFFICES
• CAFETERIAS • LODGE HALLS
• LOW INITIAL INVESTMENT • ECONOMICAL OPERATION
Write for Engineering Catalog BAE
DOLE REFRIGERATING COMPANY
5920 NORTH PULASKI ROAD, CHICAGO 30, ILLINOIS
103 PARK AVENUE, NEW YORK 17, N. Y.
Dole Refrigerating Products Limited, 44 Elgin Street, Brantford, Ont.
DOLE THE Cal LINE

Home Heating Repair Racket

(Continued from Page 1, Col. 1)

ditioning Association.

He pointed to an article in the February issue of *The American Home* magazine.

Entitled "The Dirty Furnace Racket," it is an exposure of unethical practices which harm the public—and, as a result, harm reputable heating dealer-contractors and the industry, Martin noted.

American Home reports a crooked repairman's own story of the old trick of sending out so-called "heating inspectors," who agree to put the furnace in first-class shape for a small sum, take it apart or deliberately damage it, then scare the homeowner into believing it is in dangerous condition. The homeowner then is charged an exorbitant price for unnecessary work.

Racketeer Tells of Tricks

In the article, the "furnace repair racketeer" revealed the following among tricks used to close a sale:

"Sometimes we'd jab a small hole in the humidifier so it would leak. Or we'd loosen a gas pipe.

"I'll never forget the first time I saw that one pulled. The guy I was with loosened a pipe and put a match to it. The gas started burning at the loose connection. I was so green that I didn't know that gas won't explode as long as it's burning.

"I ran out of there hollering that the thing was going to explode. This scared the owners so much that the salesman didn't have any trouble signing them up for a new furnace. Back at the shop the guys got a big laugh, but the boss thought it was so good he told me to make it a regular part of the act."

When this act was used, the "repairman" continued, "I'd go out of there screaming. The salesman would holler, 'Turn off that gas!' He'd tell the people they were lucky they hadn't been blown up or asphyxiated. For every furnace sold that way, the installer and I got 2% of the total sale."

How Homeowner Can Protect Himself

The *American Home* article concluded by advising readers how to protect themselves against furnace racketeers. They were told, in part:

"1. *Say no* to door-to-door or telephone solicitors who want to clean your furnace. If you think your furnace needs cleaning and inspection, check with your local Better Business Bureau *before* doing business with any company.

"2. *Get competitive bids* if you're installing, remodeling, or repairing your heating system. . . .

"3. *Don't sign anything* until you know what you're signing.

"4. *Don't be frightened,* hurried, or high-pressured. . . ."

Martin indicated that another current furnace racket, recently reported by the *Kansas City Star,* involves the sale to homeowners of their own heat exchangers for as much as $400.

In the Kansas City situation, a fake engineer or inspector tells the homeowner his family will be in danger unless a new heat exchanger is installed immediately. The crooked furnace man then has the old heat exchanger sandblasted for about $5, perhaps slaps a little paint on it, and reinstalls it for 80 times this cost. By reducing the thickness of the metal, the sandblasting harms rather than improves the furnace.

While it is not happy over the events which lead to the publication of such information, NWAHACA believes that the spotlight of public opinion, as represented by the articles in *American Home* and the *Kansas City Star,* and in Better Business Bureau publications, is of vital importance in focussing public attention on the need to be careful when buying heating equipment, Martin stated.

"Public condemnation for the sins of a few, are visited on the many," Martin stated. "And the only way to eliminate these repeated incidents is for right-thinking industry members to get mad enough about it to militantly campaign for education of their local markets."

Martin pointed out that a booklet entitled, "How to Enjoy Comfort Heating," was prepared by the association in cooperation with the Cleveland Better Business Bureau several years ago to expose furnace racketeers. He said that over 750,000 copies have been distributed throughout the U. S.

"But, 750,000 copies wouldn't even saturate one metropolitan market," he said. "The information ammunition with which to combat vicious, industry-defaming, gyp practices is available. But it rests upon concerned industry-people to see that this material gets into the hands of the consumers."

Equally odious as the furnace repair racket, and all the more insidious because it is not subjected to the occasional spotlight of censorous disclosure in the public press, is the installation of sub-quality, inadequate heating equipment and systems in new homes, opined Martin.

The ultimate solution toward combatting this continuing problem, in Martin's opinion, is the Silver Shield Program which is being advocated and promoted by NWAHACA.

Under this program, Indoor Comfort Bureaus are set up and are authorized to award a rating as a Comfort Guaranteed Silver Shield System to heating and air conditioning systems which meet definite standards of quality and performance.

Kansas City dealers, following the exposure of a minority of unethical operators in their city, took decisive group action to solve the problem by holding a meeting on Feb. 9 for the purpose of exploring the idea of a Silver Shield Program.

Minnesota Suit Hits Holland Furnace

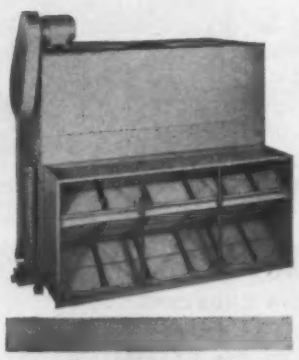
ALBERT LEA, Minn. — A suit filed in Freeborn County district court here by Walter F. Mondale, Minnesota attorney general, accuses Holland (Mich.) Furnace Co. of fraud in its sales in this state.

Mondale charged that the company "fraudulently intimidates citizens of Minnesota into buying furnaces by falsely representing that the prospect's furnace is defective and that its use will result in asphyxiation, carbon monoxide poisoning, fires, explosion, or other damage."

Mondale warned Holland Furnace that if the activities described in the suit are not halted, he will start proceedings to cancel the company's registration to do business.

There's something NEW in AIR HANDLING UNITS . . .

DUNHAM-BUSH "COMPACTS"
for COOLING • HEATING • HUMIDITY CONTROL



See us at Booth No.'s 32 & 38
15th Int'l Htg. & Air Cond. Expos.
Int'l Amphitheater
Chicago, Ill.
Feb. 13-16, 1961

Compact modern design means lower shipping costs, lower installation costs, less required equipment area, more rigid assembly. Thirteen case sizes are available . . . in either floor or ceiling mounted units, with an over-lapping range of air deliveries.

Dunham-Bush Air Handling Units the "compact line" of the industry offers the architect, engineer, and contractor a diversified selection of central station units. Dunham-Bush Air Handling Units are available with direct expansion, water or steam coils . . . or in combinations of these coils.

The Dunham-Bush-engineered flexibility of the component parts assures delivery of air, conditioned to fulfill any seasonal or product demand. Air can be filtered, cooled and dehumidified; or filtered, heated and humidified . . . depending on the requirement.

Accessory equipment available includes mixing boxes, filter sections, face and by-pass dampers for close humidity control, and both water and steam spray humidifiers.

A wide range of air outlet locations and motor arrangements makes Dunham-Bush Air Handling Units easy to specify—easier to install.

DUNHAM-BUSH
DUNHAM-BUSH, INC.
WEST HARTFORD 10, CONNECTICUT, U. S. A.
SALES OFFICES LOCATED IN PRINCIPAL CITIES